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The Metal Worker

A WEEKLY JOURNAL DEVOTED TO THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

VOL. LIII. NUMBER 3 | NEW YORK AND CHICAGO, JANUARY 20, 1900. | ONE DOLLAR A YEAR SINGLE COPIES, 5 CENTS

IRON STONE STOVE LINING.

Fits any Stove.

Plastered in like mortar. *Gets as hard as brick.*

MY FACE ON EVERY BAG.

PRICES—$1.60 per doz. 10 lb. bags in 2 doz. lots. $1.00 per doz. 6 lb. bags in 3 doz. lots. ONE CENT per lb. in bulk in Barrel.

Address WILLIAM M. NEWTON, Albany, N. Y.

For Steam and Hot Water Heating.

You Want the Best—We Have It.

SEND FOR CATALOGUE AND INVESTIGATE FOR YOURSELF.

GORTON & LIDGERWOOD CO.,

Old Colony Bldg., CHICAGO. 96 Liberty St., NEW YORK.
77 Oliver St., BOSTON, Prudential Bldg., ATLANTA, GA.

GORTON "Side Feed" BOILERS

Tinplates } Stewart Trench & Co., NEW YORK.

Gray Iron Castings. S. CHENEY & SON, Manlius, N. Y.

Don't put off until to-morrow the range you should have bought yesterday. The quicker you get the

EXCELSIOR RANGE

the better you will be satisfied. All enterprising dealers sell it.

ISAAC A. SHEPPARD & CO. Manufacturers 8 Philadelphia, Pa. Also makers of the Paragon Furnace

SOME OF THE ADS

which we use in the newspapers of several cities are shown here.

This is the way we talk to customers about our Furnaces and Ranges.

They are good arguments for you to use if you have them in stock.

ISAAC A. SHEPPARD & CO.,

NEW YORK, PHILADELPHIA, BALTIMORE.

Makers also of Paragon Hot Water Circulators and Steam Generators.

THE PARAGON FURNACE

doesn't have that awful coal appetite. All enterprising dealers sell it.

ISAAC A. SHEPPARD & CO. Manufacturers Philadelphia, Pa. Also makers of Excelsior 7 Ranges

Better change your jobber, unless he'll supply you Apollo galvanized iron.

Apollo Iron and Steel Company, Pittsburgh.

Steel Baths,

Both *all steel* and *steel copper lined,* for sale at low prices, delivered to buyer's station.

E. S. WHEELER & CO.,

256 Water St., New Haven, Conn.

New York Store, 10-12 Cliff St.
New York Showroom, 160 Fifth Ave.
Boston Agency, 220 Devonshire St.

PAGE 10 DIGHTON

No.	19.	20 in. pot,		$40.00	castings,	$8.00	casings.
"	21.	22 " "		48.00	"	9.00	"
"	23.	24 " "		60.00	"	11.50	"
"	25.	26 " "		70.00	"	14 00	"
"	28.	29 " "		100.00	"	17.00	"
"	30.	31 " "		125.00	"	17.00	"

CROSBY SPRING-SEAT GLOBE and ANGLE VALVES, IRON and BRASS.

All working parts renewable without taking the valve from piping. All parts interchangeable. Guaranteed not to leak at high pressure. Send for circular.

CROSBY STEAM GAGE & VALVE CO.,

BOSTON: 95 Oliver St. NEW YORK: 78 John St. CHICAGO: 21-23 W. Lake St.

FOR SALE:

Cheap, **Complete Sturtevant Blowing and Heating System,** containing 3000 feet of heating surface.

KIELEY & MUELLER,

7 to 17 West 13th St., NEW YORK.

WE CLAIM THE FOLLOWING MERITS FOR JENKINS BROS.' VALVES.

1. Manufactured of the best Steam Metal.
2. No regrinding, therefore not constantly wearing out the Seat of the Valves.
3. Contain JENKINS DISC, which is suitable for all Pressures of Steam, Oil and Acids.
4. The Easiest Repaired, and all parts Interchangeable.
5. Every Valve Tested before leaving the factory.
6. ALL GENUINE stamped with Trade-Mark.

JENKINS BROTHERS, New York, Philadelphia, Chicago, Boston.

THE Struthers Iron and Steel Co.

STRUTHERS, OHIO

MANUFACTURERS OF THIS BRAND

UNIFORM-SOFT-SMOOTH CLEAR FINISH

CLOVER LEAF BRAND

STRUTHERS IRON & STEEL CO. STRUTHERS, OHIO.

GALVANIZED SHEETS.

We manufacture only the highest grade Galvanized and Black Sheets. Our Clover Leaf Galvanized Sheets are uniformly soft, well coated and no rough edges; especially adapted for cornice and eave trough work or where an extra soft sheet is required. *You cannot buy a better sheet.*

QUICK MEAL

A Few Special Points of Superiority of "Quick Meal Wickless" Blue Flame Oil Stoves for 1900.

[Continued from last issue.]

6. Each "**Quick Meal**" Valve, where the oil enters it from the tank, is protected by a wire-gauze screen, which keeps back all impurities and sediment; the surfaces of these screens are from 10 to 20 times greater than of those generally employed—consequently they screen cleaner and can never clog.

7. The "**Quick Meal**" Valve, by our patent process, delivers the oil to the Burner by dripping it to near the level of the Burner—accomplishing instantaneous feed and keeping the oil cool and thereby assuring a regular, steady feed.

8. "**Quick Meal**" Burners are funnelled at their lower ends, forcing the air to enter their centers, like in the best round-wick lamps; built that way draught does not affect them much.

[To be continued in next issues.]

"Quick Meal" Steel Range sales have DOUBLED in 1899. Do you have it? If not, you have not got the "BEST."

RINGEN STOVE Co. SAINT LOUIS

LARGEST MAKERS

OF

Warm Air Furnaces,
Combination Heaters,
Steam and Hot Water Heaters

AND

Acetylene Gas Generators

IN THE WORLD.

OUR NAME IS A

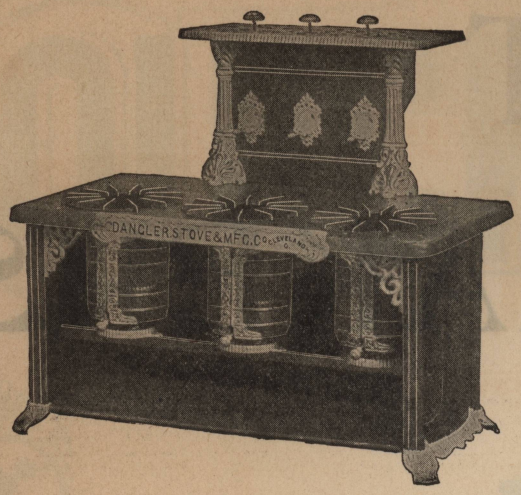
Guarantee of Excellence.

International Heater Co.,

UTICA, N Y.

NEW YORK, 237 Water St. CHICAGO, 48 Dearborn St.

BOSTON, 47 Union St. DENVER, The Kellogg & Stokes Stove Co.

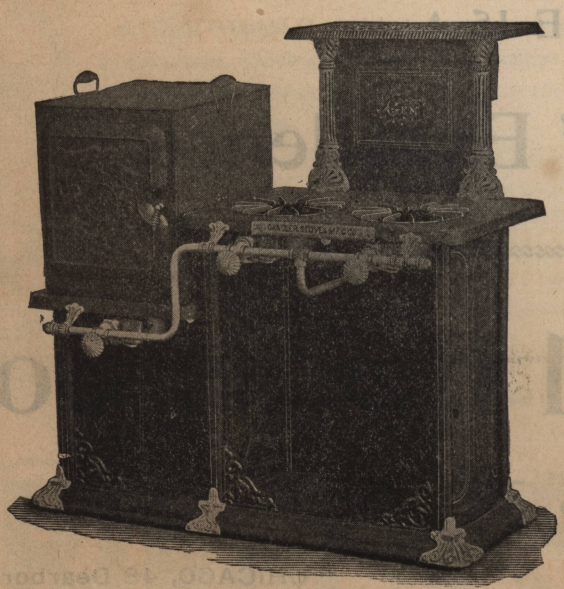


A MODEL PLANT.

While the announcement may be startling it is nevertheless true, that we have the largest, most convenient and best equipped works for this line of business in the world.

It may also seem startling to announce the fact that our lines of Gasoline Vapor and Evaporating Stoves, Blue Flame Wick and Wickless Oil Stoves and Gas Ranges, Stoves, etc., will have no equal in the market the coming season of 1900 for convenience, utility and attractiveness. Send at once for a catalog or catalogs and be convinced of what we have announced.

THE DANGLER STOVE & MFG. CO., Cleveland, Ohio, U. S. A.



1900

Our constant aim has always been to make

RELIABLE STOVES AND RANGES

The very best that skill and brains can produce.

Our Facilities are Unequaled.

Our Plant the Largest and Best Equipped.

Our Materials the Very Best.

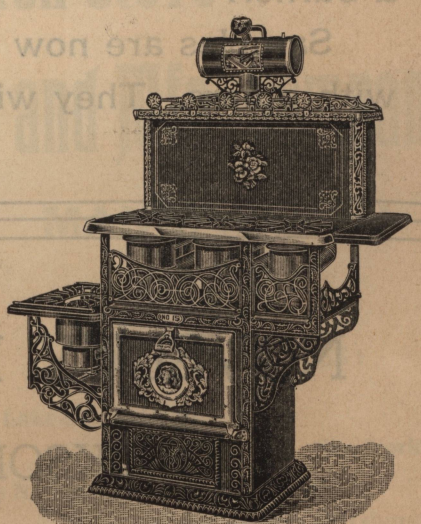
Our Machinery the Very Latest.

CATALOGUES NOW READY. *WRITE US.*

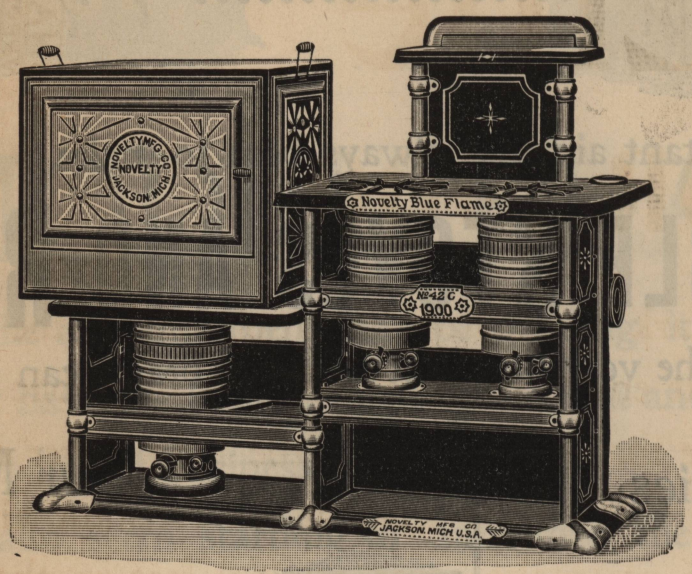
THE

SCHNEIDER & TRENKAMP CO.

CLEVELAND and CHICAGO.



CABINET COOKS.



WE OFFER to the trade for 1900, the finest line of BLUE FLAME COOKING STOVES ever seen. These are not "Wickless Wonders." They are our Wick Blue Flame Stoves that have been tried and tested for years. All mounted in handsome cabinet form.

You want them. Your trade wants them. You have had bitter experience with Wickless Stoves. There is nothing like a pure cotton wick for drawing oil and supplying it evenly to a burner.

Samples are now ready. Order a line and compare them with others. They will bear investigation.

NOVELTY MANUFACTURING CO.

JACKSON, MICHIGAN, U. S. A.

THE Monarch Line FOR 1900

as our Trade-Mark symbolizes, is emphatically the embodiment of PROGRESS. It enters its twentieth year of public service with the positive assurance that it has reached the high water mark of progressive development. We have made it our constant aim to incorporate into every pattern we make some original feature that will afford the pushing and live merchant an opportunity to build up a reputation for **High-Class Goods**, and to reap a profitable trade from their sale.

A most critical examination of every article we show will convince you, Mr. Stove Dealer, that "the **MONARCH** line is all right."

We will be glad to submit a line of samples for your inspection.

Yours very respectfully,

The Monarch Stove and Mfg. Company,

MANSFIELD, O.

BRANCH HOUSES:

67 Lake St., Chicago.
284 Pearl St., New York City.
107 N. Second St., Philadelphia.
203 Wood St., Pittsburgh, Pa.
191 Eagle St., St. Paul, Minn.

WROUGHT STEEL

RANGES

LIKE THE

"PACIFIC"

Are best because they're made stronger, better, more perfect than any other similar construction. You should write for prices and secure our Catalogue.

It is made with High Closet, Rolling Front, Six Holes, for Hard or Soft Coal; is the latest, best and handsomest Steel Range ever offered, one that you can offer as simply "out of sight" compared with that sold by the peddlers. Try it.

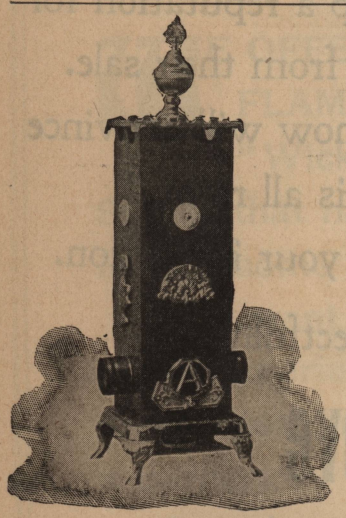
... THE ...

JOHN VAN RANGE CO.,

Warerooms:—419 ELM ST.;

Factories:—6-8-10 and 12 HOME ST.,

CINCINNATI. O.



No. 3.

ODORLESS HEATERS AND HOT PLATES.

IF IN DOUBT, ORDER SAMPLE *ON APPROVAL.* Freight Prepaid.

LAWRENCE Heaters and Hot Plates are GUARANTEED to be ODORLESS.

A DEPARTURE from the old principle of construction has brought the trade what they want—

AN ODORLESS COOKER.

Inquiries Solicited.

Territory to live Jobbers.

ACME GAS STOVE CO.,

BUFFALO, N. Y.

FURNACE AND CALDRON

(PECKHAM'S).

Made in Seven Sizes for Burning Hard or Soft Coal, or Wood;

½, ¾, 1, 1½, 2, 3, and 4 Bbl.

Made from original patterns, finely finished securing for the exterior castings a smooth, handsome appearance, and for the interior of the caldron a fine surface, perfectly circular; free from all unevenness of castings and finish.

The construction causes all the heat to be directed against the kettle and none wasted.

Doors are perfectly fitted and drafts enable the fire to be perfectly controlled.

These Furnaces and Kettles for many years have been the **Standard of Excellence** and there are none "Just as good."

Shipments promptly made.

GIBLIN & CO.,

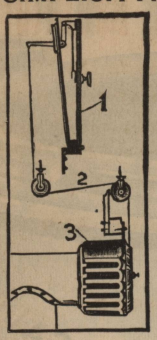
Send for Circular and Prices. UTICA, N. Y.

Howard

SIMPLICITY. **Automatic Draft Regulator**

ALSO

Sprague D. and V. Regulator.



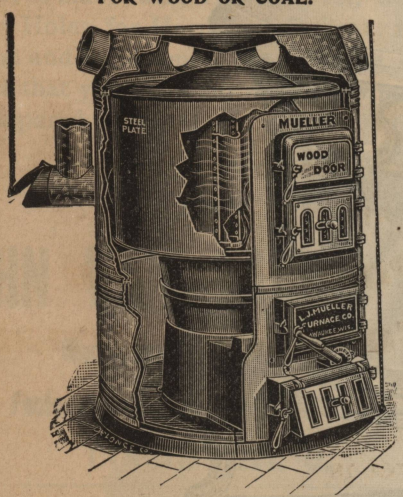
1..Thermostat.
2..Pulleys.
3..Damper or Motor.

The acmes of simplicity. This feature makes an ***unlimited guarantee*** and a popular price on them possible. No more parts than is necessary—just enough to be efficient. Your customers cannot afford to run their heaters without them, and you cannot afford to let your competitor get the agency. We will now give fall terms, which will enable you to obtain a test before bills come due. The two machines worked together will place you in a position to bid for all classes of work, and defy any competition which may be met.

Write the Mfrs.,

Howard Thermostat Co., Oswego, N. Y.

FOR WOOD OR COAL.



MUELLER

HOT AIR FURNACES,
COMBINATION HEATERS,
STEAM AND HOT WATER BOILERS.

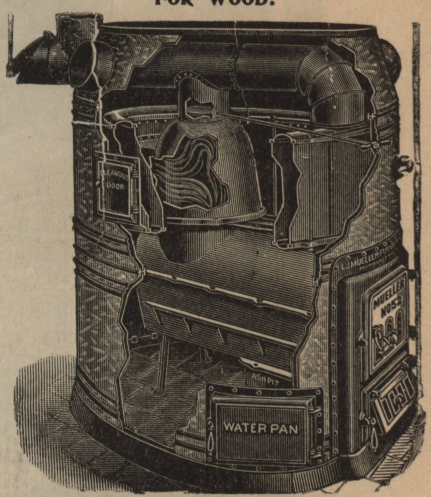
Large variety for all kinds of fuel.

WRITE FOR CATALOGUE AND PRICES.

We are also jobbers of everything pertaining to the heating trade.

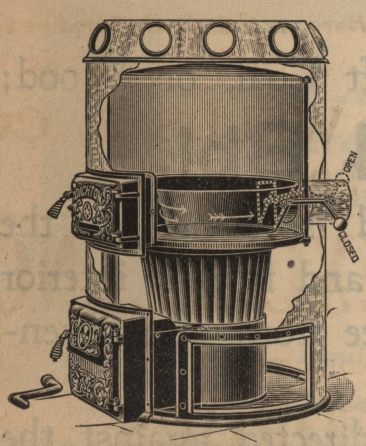
ESTABLISHED 1857.

FOR WOOD.



L. J. MUELLER FURNACE CO.

190 Reed St.,
MILWAUKEE. WIS.



A GOOD many dealers have read our advertisement in this little space.

They write for more detailed information about what we advertise.

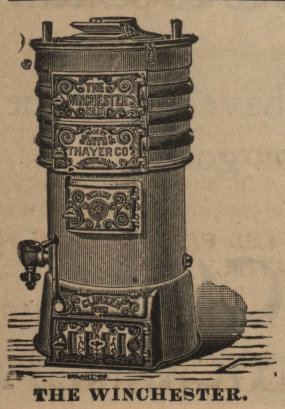
We get sample orders from some, and have had many ***duplicates*** ordered of samples.

The buyer must have got big value for his money or would not have bought again, in either December or January.

You can't buy a 31 in. pot Dighton Furnace next summer or fall for $67.50 but you can now.

We'll sell registers for a little while now at less than "in season" prices.

DIGHTON FURNACE CO., - North Dighton, Mass.

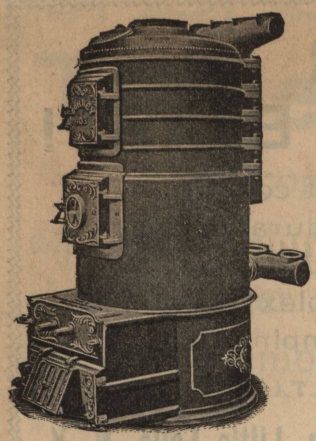


THE WINCHESTER.

WINCHESTER

UNEEDA HEETA. The above cabalistic words probably indicate the condition of most steam fitters at the present time. They are Filipino-like in looks, but decidedly American in pronunciation. At all events, the wise man will take our advice and buy a "WINCHESTER" for either steam or water contracts. SMITH & THAYER COMPANY, Boston, Mass.

HEATER.



"400 Series" Hot Water Heater.
Perspective View.

Gurney

Hot Water Heaters, Steam Boilers, Radiators

Represent the advance made of late years in the scientific construction of heating apparatus.

Our "400 Series" Hot Water Heaters and Steam Boilers embody all the latest approved ideas of construction They are of the sectional type with push nipple joints, and have the improved revolving grate.

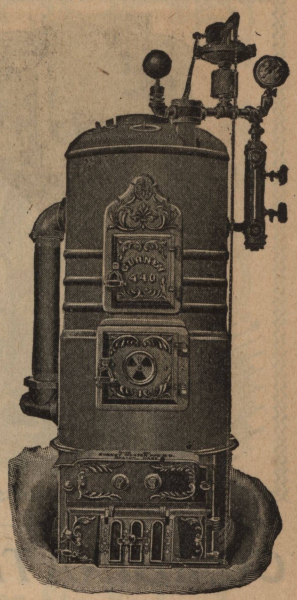
SEND FOR LATEST TRADE CATALOGUE AND DESCRIPTIVE CIRCULAR.

SOLD ONLY THROUGH THE TRADE.

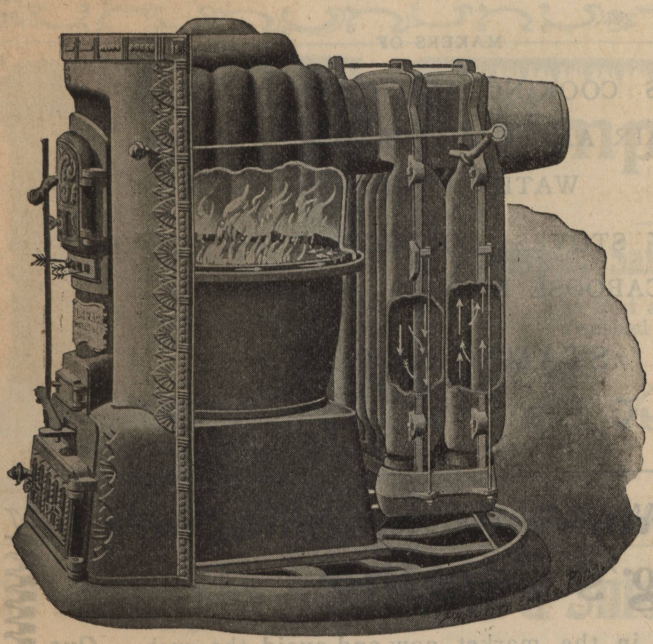
New York Branch:
111 Fifth Ave., cor. 18th St.,
NEW YORK, N. Y.

GURNEY HEATER MFG. CO.

HEAD OFFICE: 74 FRANKLIN ST., COR. ARCH,
BOSTON, MASS.



"400 Series" Steam Boiler.
Perspective View.



Eastern Selling Agents:
GURNEY & CO., 19 to 25 Eliot St., Boston, Mass.

OUR .... BENGAL

HOT AIR FURNACE IS THE

Most Powerful and Compact Furnace

Ever produced. It has more radiating surface than any other furnace of the same size, yet is

ONLY 43 INCHES HIGH.

Suits any kind of Cellar.

Burns Hard or Soft Coal, Wood or Coke.

WRITE FOR DESCRIPTIVE CIRCULARS.

FLOYD, WELLS & CO.,

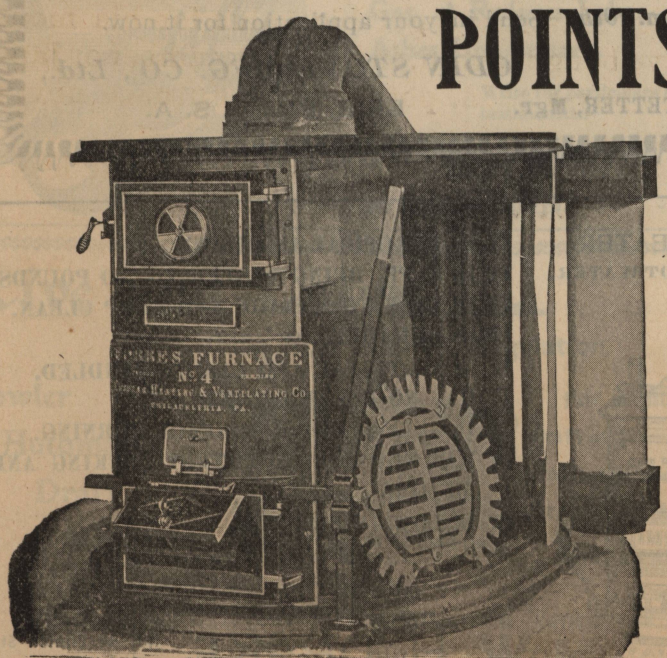
ROYERSFORD, PA.

POINTS OF EXCELLENCE

TO BE FOUND IN THE

FORBES

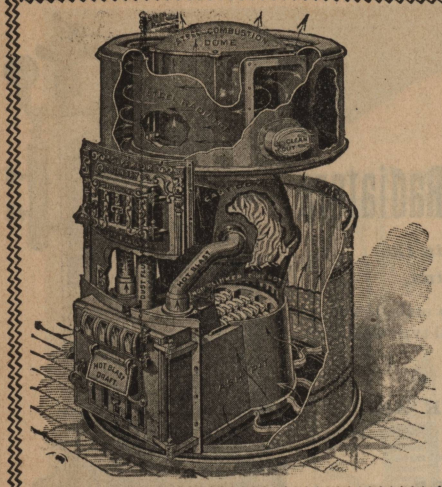
Warm Air Furnace:



GREAT EFFICIENCY, 88 per cent. by actual test.
GREAT ECONOMY.
GREAT CAPACITY.
GREAT DURABILITY.
ABSOLUTELY GAS TIGHT.
LOW HEIGHT, only 4 ft. 3 in. high in the largest sizes, a great advantage where required to go in a low cellar.
MORE PIPES CAN BE LED FROM IT THAN FROM ANY OTHER HEATER.

LOW IN HEIGHT. LOW IN PRICE.

Tubular Heating and Ventilating Co., 228 QUARRY ST., **Philadelphia, Pa.**



NEW SUPERIOR HOT BLAST!

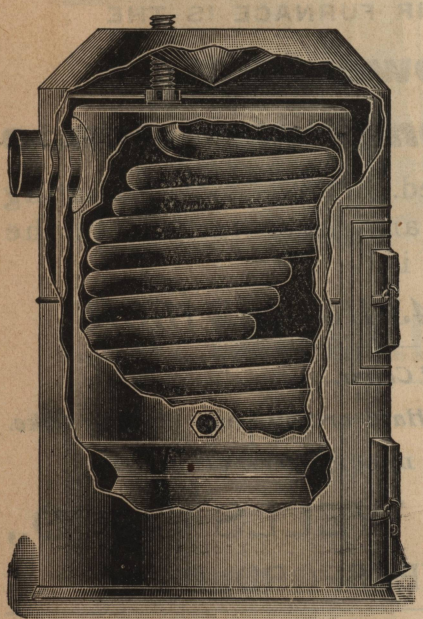
Specially adapted for burning soft coal.
Heavy castings; substantial and durable.
NO DUST! NO GAS! NO SMOKE!
Fitted with either the Smyth Duplex or our New SUPERIOR Shaking and Dumping Grate.

SEND FOR DESCRIPTIVE CATALOGUE.

SUPERIOR FOUNDRY CO., Manufacturers, Little Falls, N. Y.

COMBINATION... STOVES and FURNACES

For HOT WATER and HOT AIR Heating.



Suitable for *large* or *small houses, stores, sing rooms, conservatories, barber-shops, bath-house baptistries, hotels, factories,* and *greenhouses.*

ECONOMICAL IN COAL.
REASONABLE IN PRICE.

The National Pipe Bending Co.,
160 River Street,
NEW HAVEN, CONN.

Makers of the...
NATIONAL FEED-WATER HEATERS.

STAMFORD FOUNDRY COMPANY

MAKERS OF

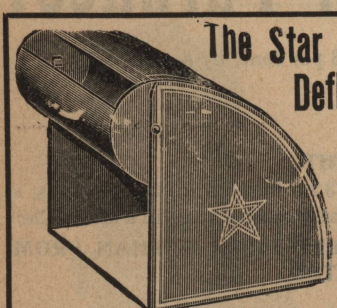
RANGES COOKING AND HEATING STOVES
HOT-AIR AND COMBINATION AIR AND WATER FURNACES
LAUNDRY STOVES CONFECTIONERS' STOVES
CABOOSE RANGES ETC ETC

STAMFORD CONN

Spring's Coming...

Get in the market now and avoid the rush. ***Our Catalog of Gas Ranges, Hot Plates, Water and Tailor Iron Heaters*** and other ***Gas Appliances*** will be ready ***Jan. 10th.*** Send in your application for it now.

ODIN STOVE MFG. CO, Ltd.,
C. H. HOFFSTETTER, Mgr. ERIE, PA., U. S. A.



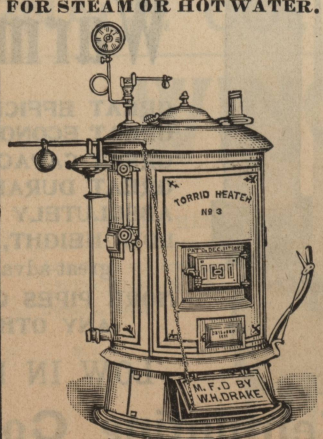
The Star Deflector.

Used on Hot Air Registers and Radiators

Patented June 2, 1896.

SOLE MANUFACTURERS AND PATENTEES.
J. Rutherford & Son, - Akron, O.
Circulars, prices and terms on application.

"TORRID" HEATER.
FOR STEAM OR HOT WATER.



IT IS PRACTICAL IN DESIGN.
IT IS SAFE, BEING TESTED TO 200 POUNDS.
IT IS EASY TO MANAGE AND KEEP CLEAN.
IT IS DURABLE.
IT IS SECTIONAL AND EASILY HANDLED.
IT HAS NO PACKED JOINTS.
IT IS SELF-FEED OR SURFACE BURNING.
IT HAS THE TORRID PATENT ROCKING AND DUMPING GRATE.
IT IS LOW IN PRICE.

SEND FOR CATALOGUE.

MANUFACTURED BY

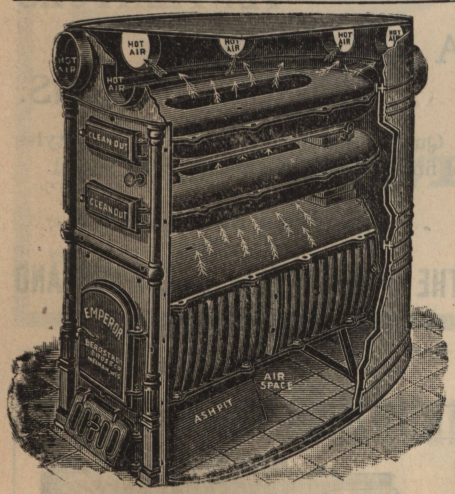
W. H. DRAKE, No. 36 Clinton St., NEWARK, N. J.
Factory: Hackettstown, N. J.

Three Points

In economy of operation, durability of construction, and the one great point of Furnace construction, **Efficiency,** the Thatcher Furnace stands pre-eminent. Add to these the small amount of care needed and you have an ideal Furnace.

PRICES TO SUIT ALL COMPETITION. SEND FOR CATALOGUE.

THATCHER FURNACE CO., WARM AIR FURNACES, RANGES, STEAM AND HOT WATER HEATERS, **240 Water St., N. Y.**



Emperor Furnaces

FOR WOOD.

Simple, Safe, Durable. Economical in Fuel.

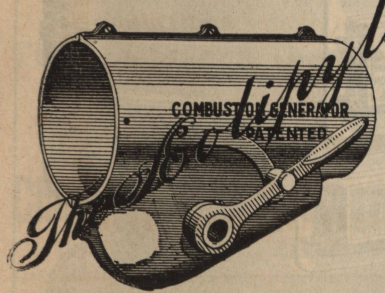
The Best and Cheapest Line of Wood Furnaces. . . .
Furnished for either Brick or Galvanized Iron Casing.

SEND FOR CATALOGUE.

Bergstrom Bros Co.

NEENAH, WIS.

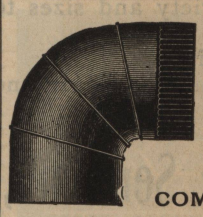
The Æolipyle Applied to a Smoke Pipe



SAVES Coal. ✱ Keeps Temperature even. ✱ Prevents Escape of Coal Gas. ✱ Reduces Labor. ✱ Sifting of Ashes Unnecessary.

Write for particulars and testimonials.

ÆOLIPYLE CO.,
117 BEEKMAN STREET, - - NEW YORK.



"VULCAN"
STOVE and FURNACE PIPE AND
FITTINGS.
A COMPLETE LINE.

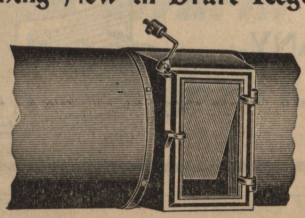
Send for List.

JAMES HILL MFG. CO.
Providence, R. I.

Live and Learn

Something New in Draft Regulation.

Fowler Automatic Draft Regulator



for regulating the draft of Furnaces, Boilers, Hot Water Heaters, Stoves and Ranges.

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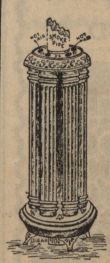
BOSTON OFFICE, MICHELL & CO., 40 State Street.



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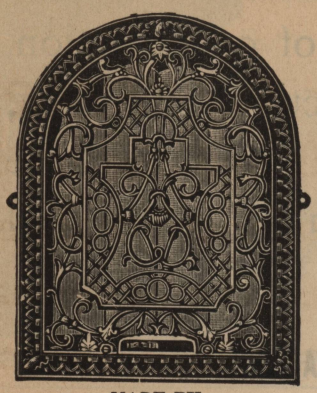

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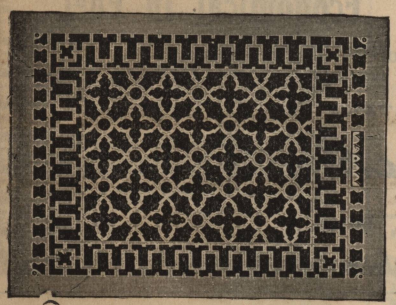

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THE WALWORTH RUN FOUNDRY CO.,
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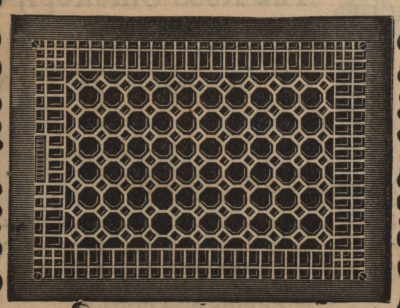

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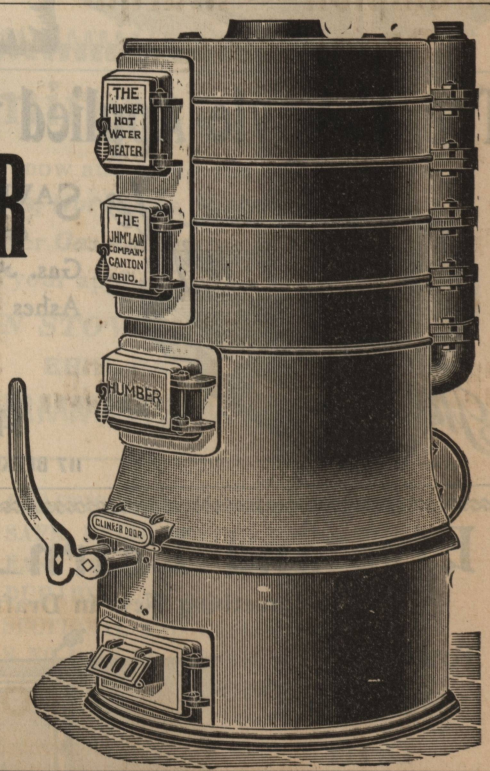

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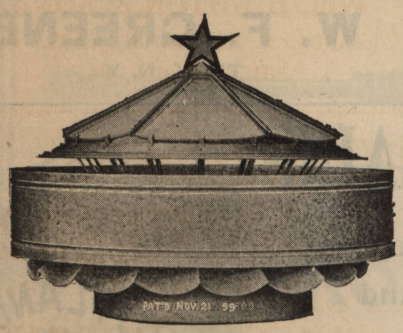

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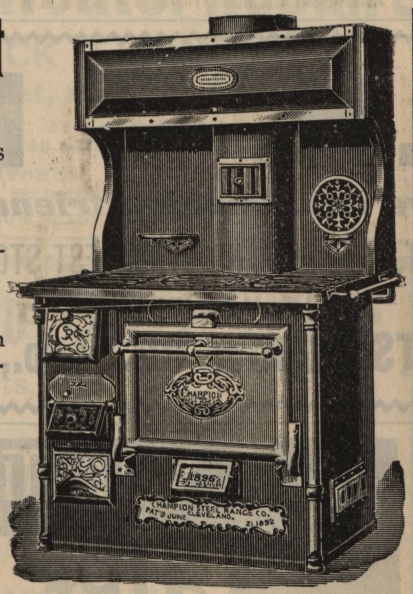

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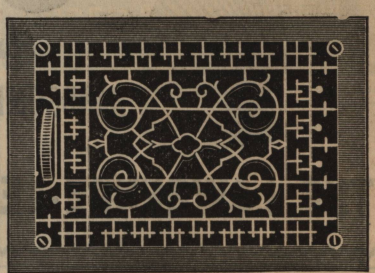

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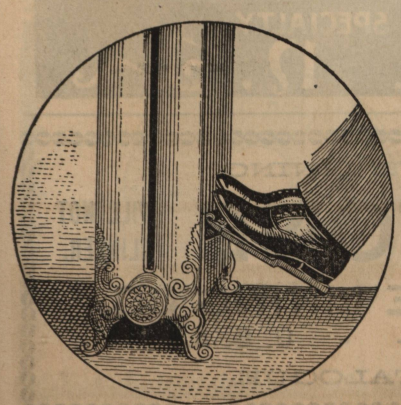

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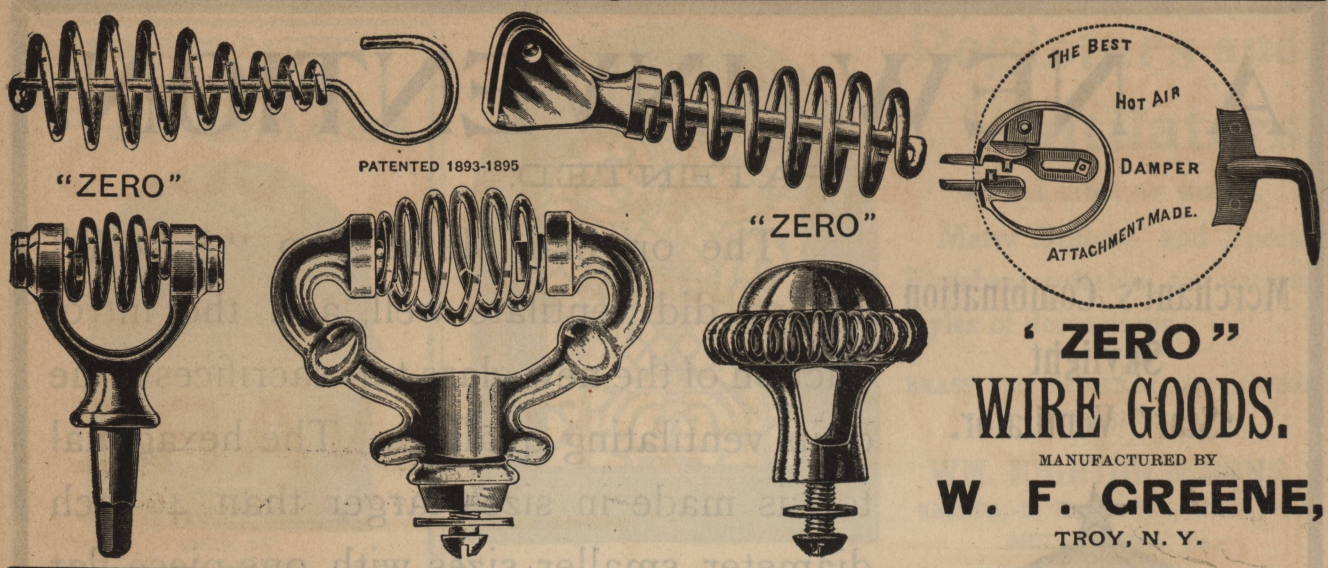

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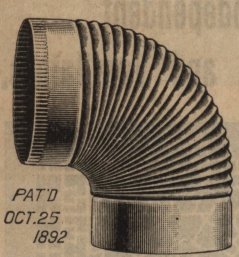

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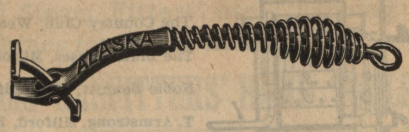

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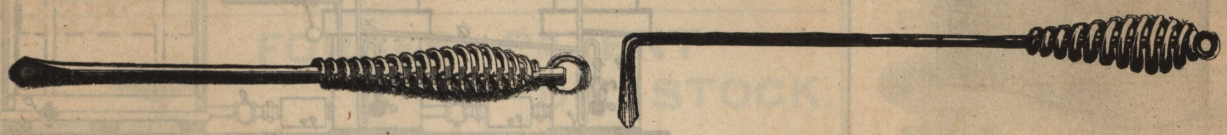

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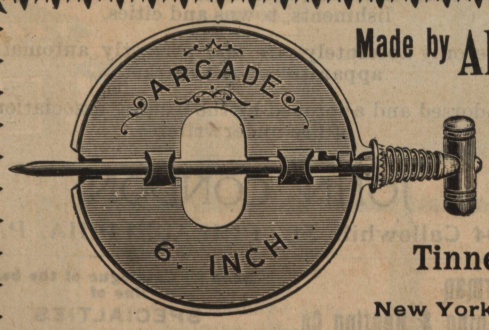

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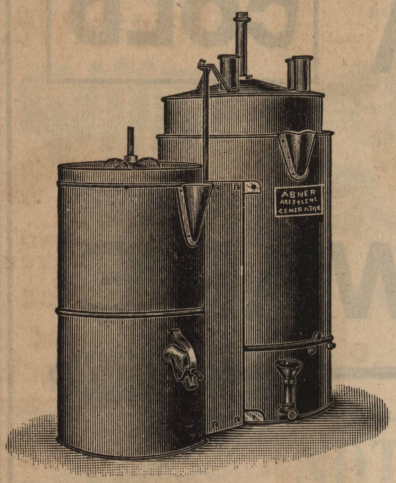

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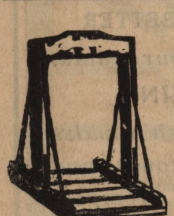

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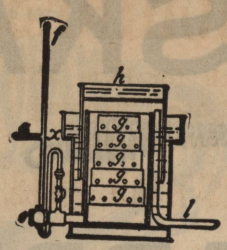

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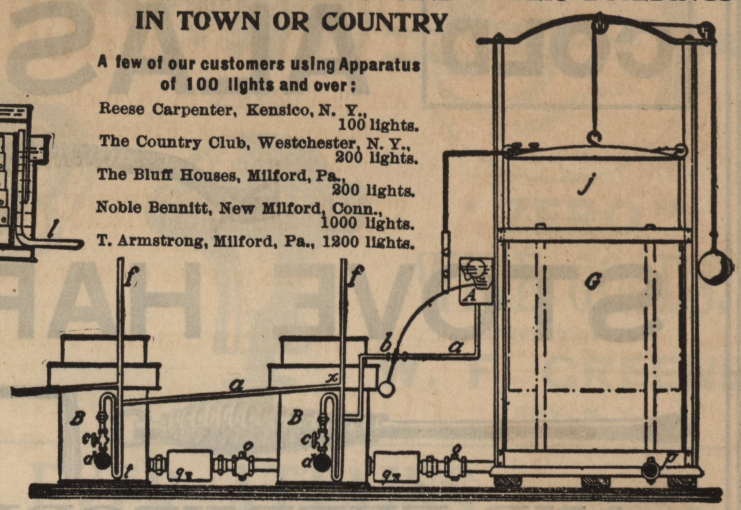

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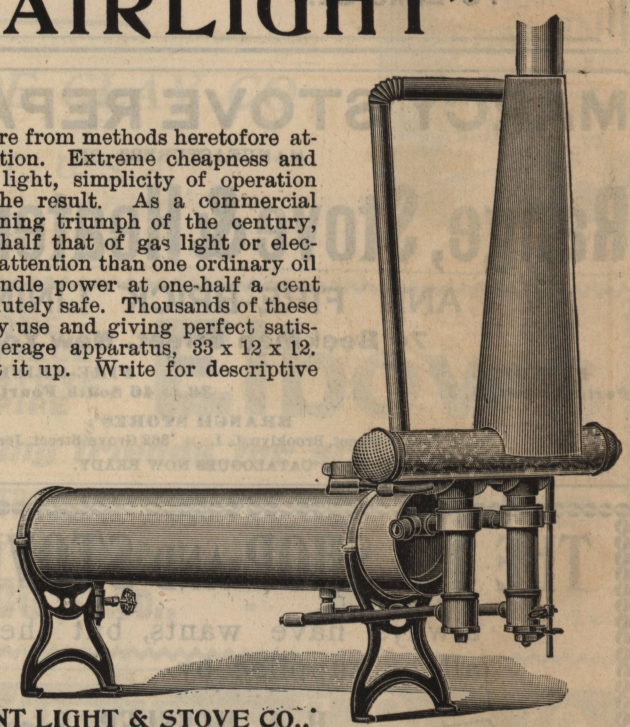

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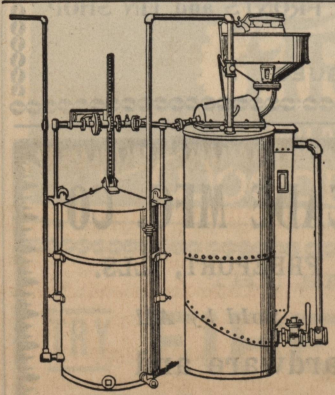

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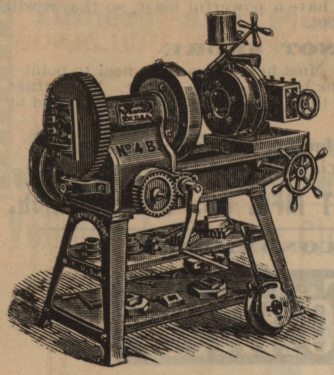

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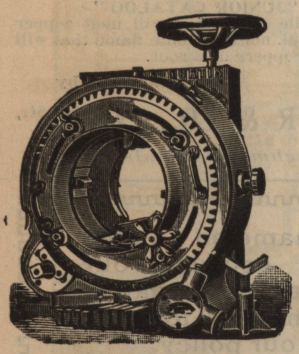

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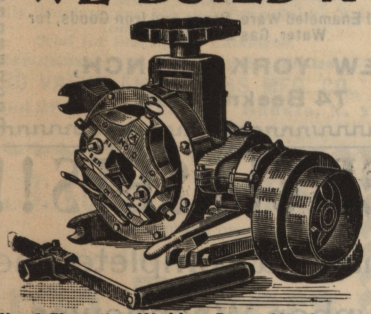

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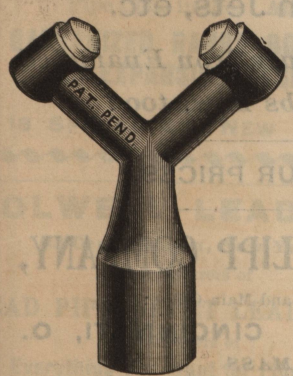

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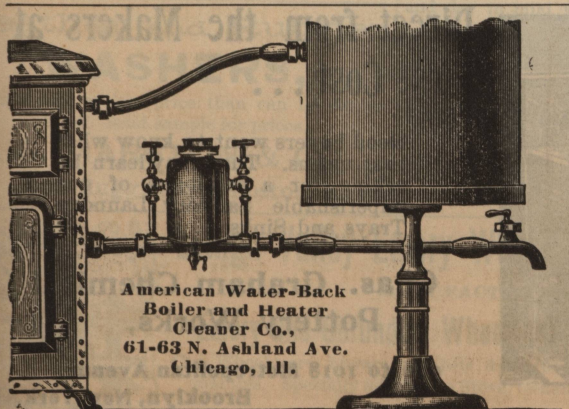

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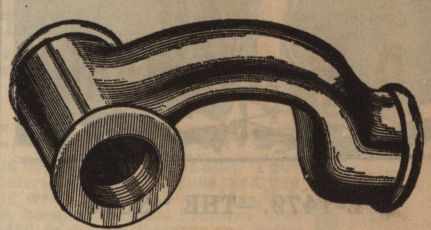

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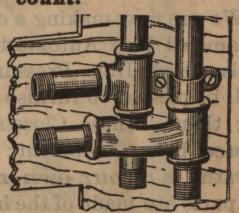

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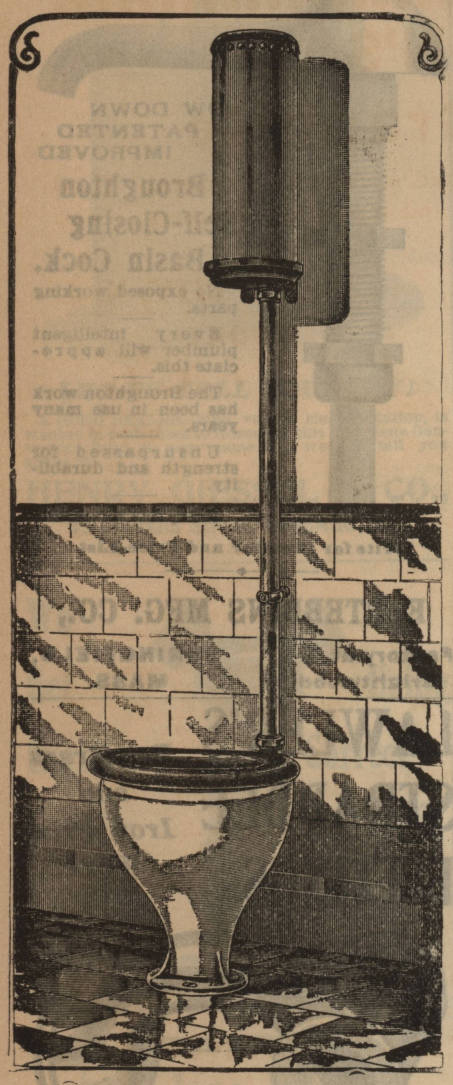

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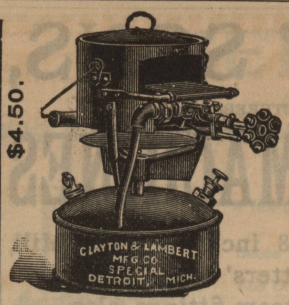

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MUST BE LIGHT,

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MUST NOT SMOKE.

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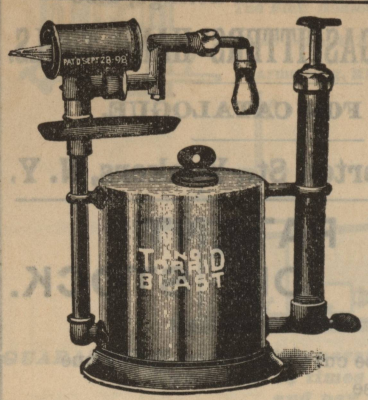

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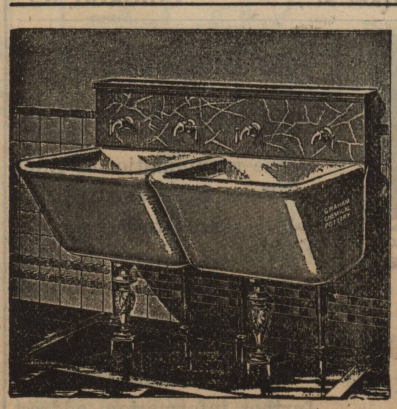

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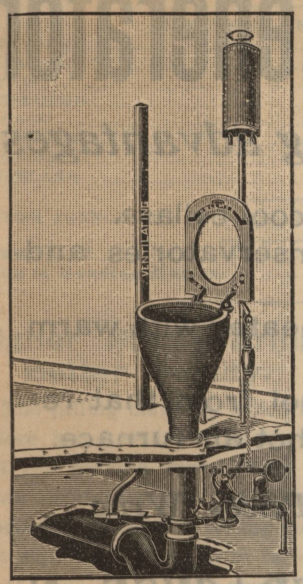

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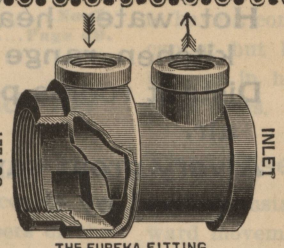

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Combination Circulation FITTING.
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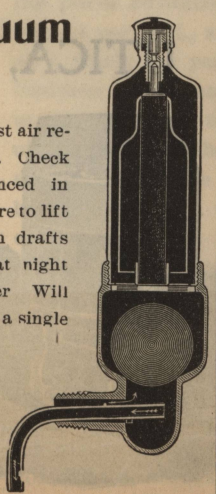

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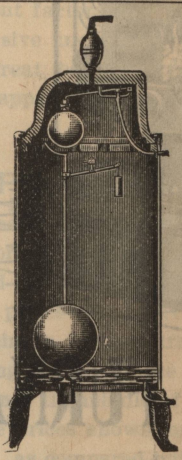

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Climax Cellar Drainer is your success also.

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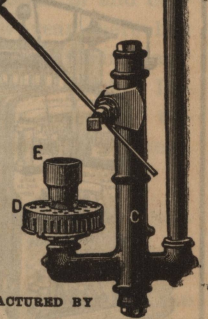

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S. T. DICKINSON, Manager.

— STYLES CHANGE. — "Pardon me, madam, but your hat is on crooked."

"Just back from the Philippines, I suppose, sir?"

"Why do you suppose so?"

"Because the style has changed in your absence."—*Cleveland Plain Dealer.*

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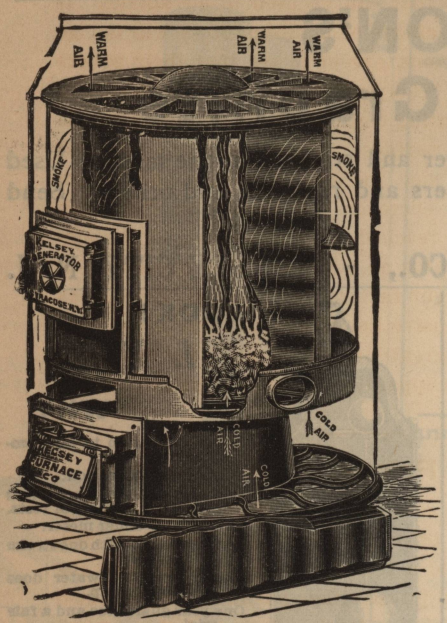

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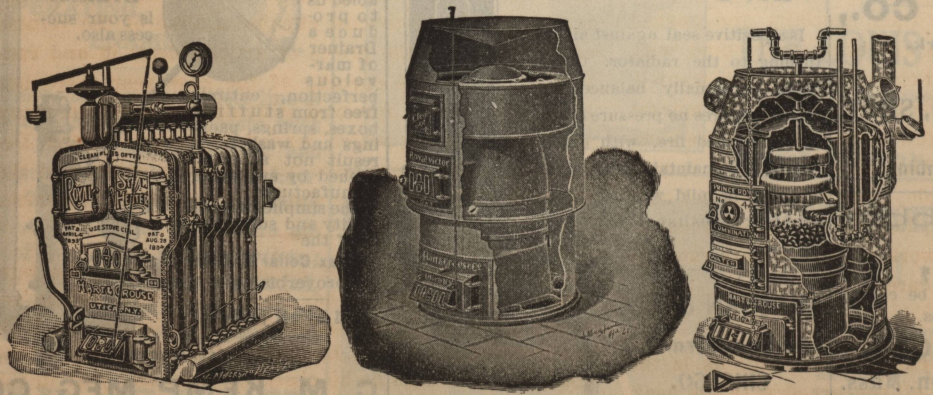

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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, January 20 1900.

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Higher Prices Bring Demand for Better Quality.

The falling markets, which had lasted so many years before being replaced by the increasing prices of the last few months, found many younger members of the trade unfamiliar with the fact that when price becomes a principal feature in selling goods quality is for a while lost sight of. Many who have been instructed to talk up the quality of their goods and leave the question of price for the last consideration have been more or less discouraged by the fact that the buyer listened with some impatience to their explanations of the superior merit of their line and only seemed to be interested in the price that was quoted. The first effect of higher prices is to cause the buyer to hesitate in making his purchases, hoping that prices will again recede to a lower level. This period, it seems, has passed, and now another old condition is being revived in the interest taken in quality. It is not uncommon now for buyers to remark that inasmuch as they are paying for a good thing, it is just as well to pay a little more and get the best.

The House Heating Boiler Trade.

This is particularly noted at the present time in the house heating boiler trade. Manufacturers have endeavored to secure the attention of buyers to their best class of goods, and to attain that end have divided their goods into a first and second class. Already those who have heretofore made price their specialty and pushed their cheapest line of goods are being confronted with the statement that a second-class boiler is not wanted. In some instances only the very best goods in the market can interest buyers, who, a few months since, were looking for the lowest price. This should prove a benefit to all connected with the trade. The best goods not only are more efficient in service, but are also more economical in use, and will do the work which they are rated to do with less attention and care.

Studying Details.

Another feature of this change of conditions is the study that is being made by all concerned with the heating trade of the best types of construction and the proper proportions that should exist between different parts of a heating system. Manufacturers are giving more attention to the proportion of fire surfaces exposed to a given amount of grate surface, and also the proportion of flue surface that can be used to advantage. It is probable that the efforts of manufacturers will not go much beyond this point, except to see that their boilers are not overrated. This tendency to sell the best will probably lead to heating contractors providing an ample amount of heating surface in each radiator connected with the job, and also the use of supply and return mains that do not encroach too closely on the mark which can only be reached with some risk to the efficiency of the apparatus as a whole. The disposition to take up these different factors and to study them so as to have a comprehensive knowledge of them is one that cannot but be of great benefit to all who have any interest in heating apparatus either as manufacturers or as users.

The Rise in Prices.

Notwithstanding some signs of hesitancy in the upward movement of prices in the closing month of 1899, mainly in metals and a few miscellaneous products, the great mass of staple prices either advanced or remained steady, the result being a further lifting of the general level of prices, leaving it at the close of the year higher than at any period since the middle of 1891. *Bradstreet's* compilation of staple prices shows, on January 1, 1900, a gain of 17 per cent., as compared with January 1, 1899, of 22 per cent. over January 1, 1898, and of 31 per cent. over January 1, 1897. Of 107 leading products, 81, or about four-fifths, were higher in price at the opening of this year than they were at the beginning of 1899, while 18 were lower. In the latter category, however, is included only one important class of products, namely, breadstuffs, which rated about 6 per cent. lower. Practically every other kind of merchandise scored a more or less heavy advance in price for the year. Among the products which show the greatest rise in value building materials stand first, with an advance of about 44 per cent. Metals come next, with a gain of 40 per cent., and coal and coke third, with a gain of 39.5 per cent. Textile prices advanced 30 per cent.; leather, 26 per cent.; oils, 14 per cent., and live stock, 13 per cent. Taking it as a whole the year 1899 was a memorable era in the business world and specially notable because of the marked tendency toward expansion alike of the volume of trade and of the prices of articles dealt in and consumed. Since the opening of the new year there has been, moreover, a renewed stiffening of prices in many of those products which tended to decline during December, while others have made further gains, and the markets all around have displayed remarkable firmness.

There is something of humor, approaching the burlesque, but which also has its pathetic side, in the account given by Lord Charles Beresford before the British Institution of Civil Engineers, the other day, of the condition of things as he observed them last year in the Chinese army. At Shanghai the admiral saw a Krupp gun with an Armstrong breech mechanism. "On asking for explanations," said he, "I was told that the original breech-piece had been blown out, and on visiting a fort later on I found out how and why. At this fort I congratulated the mandarin on having the guns (67-ton)

mounted in proper positions, and I was afterward shown the powder used. I then said, 'You surely do not use this powder in those guns?' 'Oh, yes,' replied the mandarin, 'we do.' 'But it will blow the breech-pieces out.' 'Yes, it does,' was the reply. One gun on being fired blew the breech off and killed 14 men. Then they tried the other gun, and it killed 24 men."

Driving ropes made of paper seem at the first glance to be more of a curiosity than an actual commercial article, fully tested and of real value. Nevertheless, paper rope is now being made in large quantities at Wolverhampton, England, for power transmission, and its qualities are highly commended by British manufacturers. The rope is made in exactly the same way as Manila or cotton roping, such as is used for driving purposes, and experiments recently made with ropes of all three materials proved the paper ropes the superior in pulling power and wearing qualities.

The railroad receiverships last year were very small, including only 10 roads, with a total of 1019 miles of track, and an aggregate capitalization of $52,285,000, being the smallest capitalization of embarrassed railroads since 1882. Moreover, nearly four-fifths of the total capitalization and mileage is credited to one large road, the Kansas City, Pittsburgh & Gulf. No other important road went under the care of the courts in 1899.

One of the peculiar features of the South African *veldt* is the number of great ant hills that cover the country. In the present war these ant hills are being used by the British troops as cook stoves. A piece is knocked out of the side of the hill and an outlet for the smoke made on the top of the dome. A fire is built within the hollow shell and an excellent substitute for a range is thus secured, the cooking utensils standing on top of the hill. The Indian cooks who accompany the troops, by this means, are enabled to prepare quite dainty meals in the open field.

Some idea of the enormous attendance that is looked for at the forthcoming Paris Exposition may be gathered from the fact that the printing of 65,000,000 admission tickets has been contracted for by the exposition management.

One of the novelties shown at the recent Export Exposition in Philadelphia was known as canned ice. This consists of hermetically sealed balls and hollow dishes. The balls are filled with water before they are sealed and frozen at any ice manufacturing plant. The advantages claimed for this method of refrigeration are freedom from moisture, cleanliness and convenience. As the ice within the ball does not come in contact with the air, there is no evaporation from the water as it melts and the sealed ball can be frozen continuously for years. It is claimed that one of these balls dropped into a pitcher of water will keep it cold for a whole day.

A Miraculous Boiler.

"Whenever I think of a boiler I saw over in Texas the other day," said an insurance inspector just back from a trip through the Lone Star State, "I feel an icy creeping about the roots of my hair. I found it on a hillside in a country town, but I am by no means certain it is still there. In fact, I wouldn't even bet on the hill being in the same place. The boiler was extremely old. It looked as if it might belong to the glacial period, and was totally devoid of indicators, gauges, or anything else to show the head of steam or quantity of water. The proprietor was a placid German, who told me he filled it every morning with a bucket. I asked him how he estimated the pressure, and he replied that he occasionally let off a little steam, and if it 'looked blue' he ceased to poke the fire. After I heard that explanation I hastily retired to the other side of the town, and didn't breathe easy until the train pulled out. The old boiler has been rocking along for the last 10 years, and its presence on earth each consecutive day of that period is a full-blown, 18-karat miracle. It is a capital illustration of the deep depravity of inanimate things. If it was located in the heart of the city, where it could blow up a hundred or so human beings at one fell swoop, it would explode in less than five minutes by the watch. Out there, where the best it can do would be to mix up the Dutchman and the hill, it evidently doesn't consider the results worth the exertion. I think it must be waiting for a Sunday school picnic."—*New Orleans Picayune.*

Free Scientific Lectures.

Valuable courses of free lectures on scientific subjects, of special interest to artisans, are now being given in New York City, under the auspices of the Board of Education, as follows:

At St. Bartholomew's Lyceum Hall, 205 East Forty-second street, Prof. E. R. Von Nardroff will give a course of very fine lectures on "Heat as a Mode of Motion" on successive Saturday evenings. The same course is being given by Professor Von Nardroff on Wednesday evenings at the Y. M. C. A. Hall, 52 East Twenty-third street. All of these lectures will be illustrated by experiments and stereopticon views.

At Public School No. 15, 728 East Fifth street, a valuable course on "Physics," illustrated by many experiments, is given by J. Newton Gray, on successive Thursdays.

A course of two lectures on "Sound," illustrated by the telephone and phonograph, will be given by T. I. Jones, at Public School No. 5, 141st street and Edgecombe avenue, on January 22 and 29. These lectures will be given also at Public School No. 64, 2436 Webster avenue, on January 25 and February 1, and at Public School No. 61, Third avenue, between 169th and 170th streets, on January 26 and February 2.

A lecture, illustrated by experiments and stereopticon views, will be given by W. W. Ker, on "Electricity in Our Homes," at Public School No. 64 (Fordham), on January 11; at Public School No. 61 (Third avenue, 169th and 170th streets), on January 12, and at Public School No. 5 (141st street and Edgecombe avenue), on January 15.

F. M. Pedersen will lecture on "Wireless Telegraphy" at Public School No. 64 (Fordham), on January 18; at Public School No. 61 (Third avenue, between 169th and 170th streets), on January 19, and at Public School No. 29 (Albany and Carlisle streets) on February 15.

A lecture on "The Horseless City, or the Age of Automobiles" will be delivered by Max Lowenthal at Public School No. 5, on February 5, and at Public School No. 64 on February 8.

W. J. Clarke will lecture on "Wonders of Modern Science" at Public School No. 5, on January 8; at Public School No. 61, on February 9, and at Public School No. 64 on February 15.

F. W. Skinner will deliver a lecture on "Bridges" at Public School No. 5, on February 12, and at Public School No. 64, on February 22.

At the Y. M. C. A. Hall, 5 West 125th street, W. T. Elsing will deliver an illustrated lecture on "Water: Its History and Mission," on January 27. This lecture will be repeated at Public School No. 29 (Albany and Carlisle streets), on February 1, and at Public School No. 85 (735 East 138th street), on February 6.

These lectures begin promptly at 8 p.m. All interested are welcome.

J. P. Beggs has been appointed resident manager of the Central Foundry Company's cast iron soil pipe plant at Bessemer, Ala., in place of A. S. Baxter, resigned.

FURNACE HEATING.*

BY WM. G. SNOW.

CHAPTER VI.

HEATING OF PUBLIC BUILDINGS, CHURCHES AND STORES.—(*Concluded*).

HOT WATER COMBINATION.

It is often desired, when several furnaces are employed, to run but one continuously, the others being used only when the auditorium or the entire building is occupied. When some of the rooms are located at a distance from the furnace, as in Figs. 36, 37 and 38, the simplest way to heat them is by means of a hot water combination applied to the furnace as described in Chapter III.

SMOKE PIPES AND FLUES.

If the smoke pipes are very long the smoke is likely to become so cooled that the draft will be seriously diminished, causing gas to leak from the furnace into the basement. The liquid commonly called creosote, which condenses from the smoke and oozes from the pipes, is troublesome in certain places, besides rapidly corroding the iron These troubles may be avoided to a great extent by covering the pipe with non-conducting material.

If made tight and of ample size smoke pipes, in connection with a good chimney 60 or 70 feet high, may be run 60 to 80 feet horizontally without trouble. The smoke flue may be run up inside the ventilating shaft to advantage, the waste heat stimulating a more rapid ascent of the air.

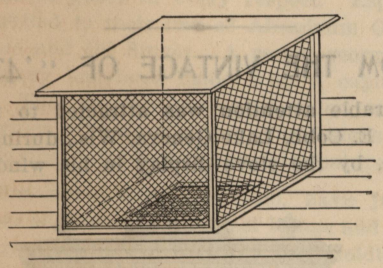

Fig. 46.—Register with Guard Having Marble Top.

THE HEATING OF STORES.

For heating small isolated stores or those at the end of blocks the size of the furnace may be determined from the exposure, as stated in Table II. For inside stores exposed only at the front and rear the size of the furnace may be calculated in another way.

The space per occupant is generally so large, except in crowded districts, that the volume of fresh air to be admitted is seldom considered in estimating the size of the furnace.

SIZE OF THE FURNACE.

If its size is to be based solely on its ability to heat a given space, regardless of the air supply, we may proceed as follows: Assume the temperature of the entering air to be 140 degrees, that of the room to be 70 degrees and that of the outside air to be 0 degree. One-half of the heat brought in is lost through the walls by transmission before the air escapes at 70 degrees temperature; in other words, twice as much heat is supplied as that lost by transmission. One square foot of grate burning 5 pounds of coal per hour will supply to the air passing through the furnace in zero weather about 4000 heat units, which is equivalent to that transmitted by 470 square feet of glass. But since twice as much heat must be supplied as that lost by transmission 2 square feet of grate surface will be required for each 470 square feet of glass, or 1 square foot to 235 square feet of glass. Hence to find the square feet of grate required reduce the area of walls, floors and ceilings to equivalent glass surface (E. G. S.). This divided by 235 = G. S. required. The corresponding diameter of fire pot may be found in Table XXII.

In narrow, deep stores in blocks the entire front and most of the rear is generally glass. If not it should be so considered to allow for the cooling effect of frequently opened doors. To provide for quickly warming narrow, deep stores—*i.e.*, those in which the depth exceeds, say, three times the width—add 10 per cent. to the grate surface based on the exposure.

Where it is necessary to have basement doors open in winter for the handling of goods the loss of heat through the floor should be added. Its equivalent glass surface equals one-twentieth its area. With a tight basement the loss of heat through the floor may be neglected. The equivalent glass surface of a ceiling with non-heated attic above is equal to one-twentieth its area. When the ceiling is directly under the roof with no attic space its equivalent glass surface may be considered equal to one-tenth its area.

COLD AIR BOX AND REGISTERS.

The cold air box should be arranged with a branch, so that the air may be used over and over to warm up quickly

Having determined the size of the furnace the combined area of the hot air pipe may be found by allowing about 1¾ square inches of pipe area for each square inch of grate surface—*i.e.*, average fire pot area. The net area of the registers should be 10 to 25 per cent. in excess of that of the pipes which supply them.

It is well to locate the registers in the walls or in the front of counters instead of in the floor. If floor registers must be used a guard similar to Fig. 46 may be placed over them to prevent their use as cuspidors. Such an arrangement is frequently found in railway stations.

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FURNACE MANUFACTURERS' ASSOCIATION.

A meeting of the Furnace Manufacturers' Association was held at the Murray Hill Hotel, New York, on Friday, January 19, and was in session at the time *The Metal Worker* went to press. A special committee had been at work on a scale for uniform prices and the classification of hot air furnaces in different grades, according to their weights, dimensions and type of construction, and the meeting was to be largely occupied with the consideration and adjustment of the recommendations of the committee's report. Prices of hot air furnaces have not been advanced by independent action in proportion to the present cost of manufacture, and it would seem probable, therefore, that now that the manufacturers are acting more in harmony, prices of hot air furnaces are likely to be higher than at the close of last year.

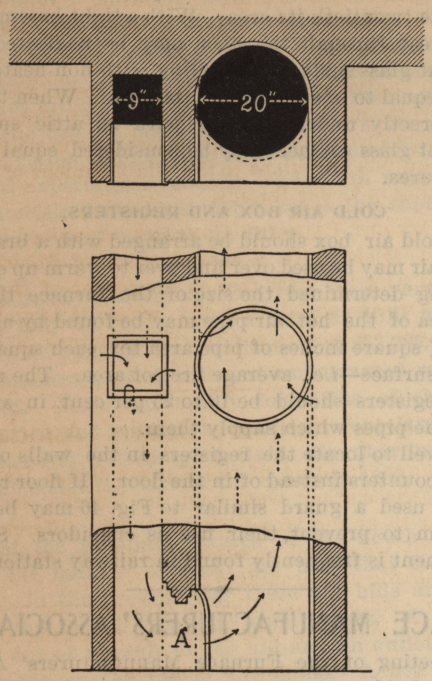
Boynton Furnace Company.

The annual meeting of the Boynton Furnace Company, 207 and 209 Water street, New York, was held recently, and the following officers elected for the ensuing year: President, N. A. Boynton; vice-president and treasurer, E. E. Dickinson; assistant treasurer, C. M. Benedict; secretary, William Ritchie; manager steam and hot water department, A. B. Marshall. The foundry and manufacturing department will continue under the management of Joseph Woodell, who has had a long and successful experience with the company. During the past year the Boynton line of ranges, furnaces and steam and hot water heaters increased their popularity, and the company start the new year prepared to make prompt shipments, and have the facilities to continue them during the busiest seasons. Their showrooms have much to attract the heating contractor, who is invited to examine the Boynton line.

The Warren Steel Range Company, Warren, Ohio, are erecting a four-story, 40 x 120 feet, addition to their works, doubling their capacity. This is being done to keep pace with orders for their Steel Ranges.

A Chimney Freak.

There are few mechanical engineers, says *The Locomotive*, who have not had experiences, in the course of their career, which were exceedingly puzzling at the outset, but which became ludicrously simple upon investigation. An instance of this, from our own practice, forms the subject of the present article. A certain apartment building was to be heated by steam, and our experts were retained to design the plant, and supervise its installation. The contractor appeared to be making an honest effort to do his work right, and we



A Chimney Freak.—Diagram Showing Chimney and Course of Draft.

were well satisfied with the general course that things were taking, and anticipated no trouble whatever, as the radiators and the heater were ample in size, the piping was well arranged, and the work, as we have said, was being well done, so far as we could judge, from our periodical visits to the building while the plant was being put in.

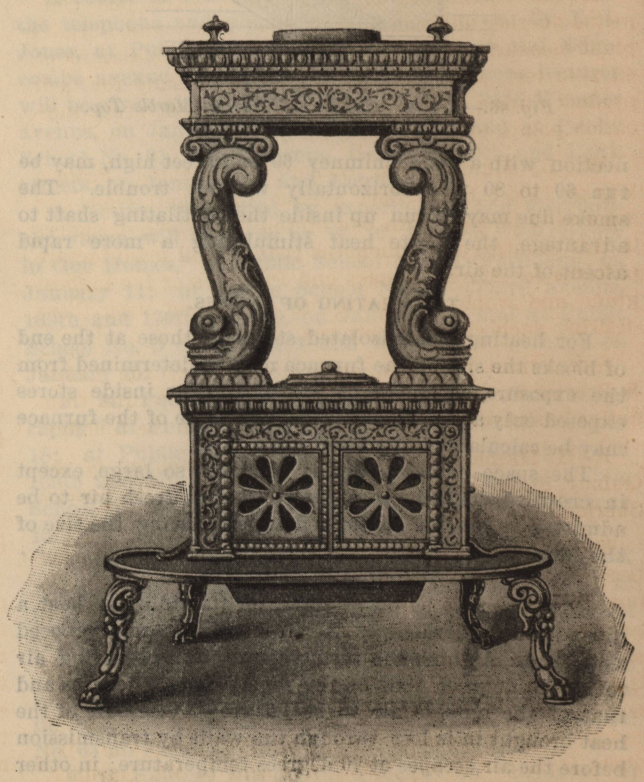
It is the unexpected which happens, however, as Professor Sweet has so well said; and when the boiler was fired up for a trial, we were greatly surprised at its misbehavior. In order to make the case intelligible, let us first give a few details of the arrangement of the plant. The steam for the system was furnished by a boiler which discharged its products of combustion into a circular flue 20 inches in diameter, which is shown in the illustration. It was necessary to provide the tenants of the building with hot water as well as steam, and, as the hot water would be required throughout the year, while the steam would be needed only during the winter, a small auxiliary boiler was provided for heating the water, so that it would not be necessary to run the big one through the summer. The small boiler was supposed to discharge its products of combustion into a separate flue, 9 inches square, which was built by the side of the big circular one, as indicated in the illustration.

When the preliminary test was made, it was found that the draft was very poor in both flues. The dampers were pulled wide open, and every effort was made to accelerate the combustion in the furnaces, but nothing would induce the fires to brighten up into anything like the condition that we wanted to see. Plainly, the thing wouldn't work; and, as we knew how everything was proportioned and arranged (or thought we did), it was hard to understand how the things that were could be. After a good deal of hard but unprofitable thinking, and a few superficial experiments that didn't show anything, we had the 9-inch smoke pipe pulled out of its flue. A candle was then lighted and held up to the opening. It showed that there was a draft into the flue. We then pushed the candle away in, until it entered the vertical part of the flue, and the thing that happened then was so startling and altogether unreasonable that the contractor, who was assisting in the operation, made a few cursory remarks. The flame of the candle was drawn straight downward, and with such violence that the flame burned blue for a second and then went out. There was good enough draft in the flue, but it went down, toward the bowels of the earth.

A section of the front of the flue was then torn out, and it was found that the mason, who seems to have known very little about draft and combustion, had made a large and very neat opening between the two flues at the bottom, as indicated in the sketch by the letter A. The steam heater had warmed up the air in the 20-inch flue, and started an upward current there, and a powerful circulation had then been established, the outside air going down the 9-inch flue, around through the opening at A, and up through the 20-inch flue again. A supply of bricks and mortar was obtained, the opening at A was walled up as shown by the two dotted lines, and the front wall of the flues was replaced; and after this we had all the draft that any one could wish; and the engineer said that he "had to run with his dampers shut, to keep the safety-valves from scaring the tenants to death."

FROM THE VINTAGE OF "'43."

Considerable attention was attracted to the stove store of H. E. Cobb, Lake Geneva, Wis., during the last fall season, by the stove display in his windows, one



From the Vintage of "'43."

of which was a full nickeled high grade parlor stove of the latest design, while beside it was shown a stove more than half a century old. This latter stove was manufactured by Johnson, Gier & Cox of Troy, N. Y., and bears the date of 1843. The stove is still in a fine state of preservation, and could be used for heating. The lower portion of the stove forms a large fire box, and has a large opening on the top which can be used for cooking or for replenishing with fuel. Doubtless

this opening has been occupied by a singing tea kettle, as was the custom at the time when it was popular with the people. The products of combustion rose through two flues formed of two dolphins, and were discharged into an upper chamber, from which the pipe carried them to the chimney. While its appearance differs greatly from the approved style of to-day, there is much in it to be admired.

ODD PLATES.

IT is reported that Alexander J. Barbour, the purchaser of the Raymond & Campbell Stove manufacturing plant at Middletown, Pa., will operate it on a large scale.

THE MONARCH STOVE MFG. COMPANY, Mansfield, Ohio, are now domiciled in their new factory of brick and stone, four stories in hight, 100 x 200 feet, the interior of which is equipped with all the latest tools and appliances for the production of Gas, Gasoline and Oil Stoves and Ovens. The company, owing to the complete destruction of their former plant, have been compelled to use entirely new patterns throughout, the result being a superb line of goods in every respect. Especial attention is invited to their line of Aluminum Ovens for Gas, Gasoline and Oil Stoves. A recent reorganization of the company has been made with a capital stock of $100,000. The company have now under way a new catalogue, which will show many new designs of their goods, embodying novel and practicable features.

SCHILL BROTHERS, Crestline, Ohio, have just completed another addition to their Steel Range and Furnace plant measuring 50 x 100 feet, also a new molding room, 40 x 40 feet, and state that while the demand for their product during 1899 was exceptionally good, every indication points to an increase for 1900.

W. L. MERSFELDER, owner of Brighton Pattern Works, 1106-1110 Harrison avenue, Cincinnati, Ohio, has associated himself with one of the best Stove designers in this country, and announces that he will manufacture patterns for Stoves, Ranges and Furnaces of the highest grade and would be pleased to correspond with those desiring such class of patterns.

SHERBURNE PEARSON, superintendent of the Culter & Proctor Stove Company, Peoria, Ill., has retired from active business after a service of 33 years in the foundry.

A. H. HEIDBREDER has been elected president of the Quincy Stove Mfg. Company, Peoria, Ill., vice Joseph Sheridan, resigned.

MRS. HENRIETTA E. KUPPER, Burlington, Iowa, has become famous not only through the West, where she has labored so diligently and successfully in behalf of hardware organizations, but her name is well known all over the country. It was particularly gratifying, therefore, to the Michigan Stove Company to receive from her a New Year's letter, in which she wishes them the compliments of the season and continued prosperity. We quote from her letter, which was sent to Mr. Gardner, as follows: "The close of the nineteenth century finds our nation pre-eminent for valor, for statesmanship and deeds of deathless glory among all the nations of the world, and prosperity reigns throughout her broad and fertile domains. The resistless march of mind, the triumphs of intellectual power, the products of labor and ingenuity, blaze forth with increasing splendor, and I have no hesitancy in asserting that the Michigan Stove Company still ranks in the van, and in its line of enterprise and business towers proudly four-square to all the winds that blow."

F. PICKERING, Sandusky, Ohio, will continue to represent the Bellaire Stove Company, Bellaire, Ohio, in the West for the sale of their Stoves and Ranges.

AMONG recently licensed corporations in Illinois are the following at Chicago: The Lakeside Stove Company, with a capital of $2500, for the purpose of manufacturing Stoves and Heaters, incorporated by Andrew F. Burnett, Jas. R. Ward and Wm. Roulet; the Daniel Carmichael Range Company, with a capital of $2500, for the purpose of manufacturing Ranges and Cooking Apparatus, incorporated by Daniel Carmichael, Otho D. Swearingen and John Bierma; Graves Bros. & Co., with a capital of $2500, for the purpose of dealing in Heating Supplies, incorporated by Charles H. Graves, James F. Forsyth and Richard A. Steen.

LOCAL capitalists of Cedar Rapids, Iowa, are forming a stock company for the manufacture of Hot Air Furnaces. The success of similar enterprises in neighboring towns is quite a stimulant to the establishment of such an undertaking in Cedar Rapids.

THE DETROIT REGISTER COMPANY, organized last year in Detroit, Mich., with a capital stock of $15,000, have purchased a lot 100 x 250 feet on the corner of the Boulevard and Orleans street, that city, where it is understood they will erect a factory for the manufacture of Hot Air Registers.

Kansas Retail Hardware Dealers' Association.

The annual meeting of the Kansas Retail Hardware Dealers' Association was held in Topeka on January 9 and 10 at the Hotel Throop. The different parts of the State were well represented and the meeting was an enthusiastic and profitable one.

The convention was called to order by the president, Frank Rudy of Paola, who made the following address:

President's Address.

A little more than a year ago the Kansas Retail Hardware Dealers' Asociation was organized by a few dealers assembled in this city. How much has been accomplished during the year I will leave for our secretary to report. Possibly there has not been the interest taken or the increase in membership has not been as large as some of us would like to have seen, but I think that is the history of almost all associations during the first year and I feel very well satisfied with the work so far accomplished, and with the beginning of another year, I predict that we shall increase in numbers to such an extent that we will be well up with some of the older organizations in other States. You know Kansas never does anything by halves when she gets started. There is not any dealer in the State that can afford to remain out of this association if there was no other object in view except to meet together as a body of business men to exchange methods of doing business and become better acquainted with each other.

But there are many things which can be accomplished within this association if we work together for that purpose and eventually become one of the links in the chain of State associations which will form a national association that will be of such power in trade circles that those who now trespass upon the rights of the retail dealer will cease their methods of doing business or lose the better part of their trade.

There are jobbers, I am informed on good authority, that send salesmen into this State. One will visit the regular Hardware trade, the other calls upon other firms. Such jobbers are not worthy of the patronage of any Hardware merchant. And again there are jobbers whose salesmen do not visit that class of trade, but the house sends out trade circulars and fills mail orders. This practice should also be denounced by every dealer.

I could enumerate many objects that these State associations are organized for, but you are as familiar with these as I am. I would like to see every traveling Hardware salesman in this State a member of our association, working for its interest, and by so doing increase the ties of friendship that exist between merchant and salesman.

Before I close I wish to bring before you for your consideration a few matters pertaining to our constitu-

tion and by-laws. I think our Legislative Committee should consist of one member from each Congressional district. I would also favor having a Grievance Committee to whom all matters in that line could be referred for adjustment by the secretary.

In conclusion, I wish to thank all for the co-operation you have given me during the past year and hope my successor will have the same hearty support during the coming year and that we may all labor in harmony, and when we meet next year we will see many faces that are not here to-day, that are brought into the fold by seeing the good work our association throughout this country is accomplishing.

The report of the secretary-treasurer, J. A. Cole of Topeka, was next presented, as follows:

Secretary's Report.

This, the first report of the Secretary of the Kansas Retail Hardware Dealers' Association, will be very brief, as our members have given me very little work to do up to date. There have been some complaints made by some of the members that certain wholesale houses were selling goods to their customers or were sending goods into their territory to consumers, and in each case I have corresponded with the wholesale house and they have in every instance treated my letters with the greatest consideration and disclaimed any intention of interfering with the business of the retail Hardware merchant and would thereafter be more careful in sending out goods. I have had but one case where a member definitely claimed damage from the jobber, and in this instance, after a full examination, the jobber allowed the amount of damage asked.

Now it may seem to some of our members that there has been but very little done, this, the first year of our existence, but if they will stop to consider they will see where it leads. "A word to the wise is sufficient," and if a wholesale dealer gets caught sending goods to those who are not legitimate Hardware dealers once he is more careful the next time, thereby helping all of us.

Soon after our organization on February 13 of last year, and acting upon instructions from the president, I sent out nearly 1000 circulars to dealers through the State, in response to which we obtained our membership of 36 members. I also had letters from quite a number of dealers who stated that they were heartily in accord with this movement, but as they handled Implements with their Hardware and were members of the Implement Dealers' Association, having some 1000 members in this State, they did not think they were justified in joining this one; but I do not think they quite understand our position, for although we are not many as yet in numbers, we can depend upon the assistance of every Retail Hardware Dealers' Association in the United States, if we should need it and ask for it.

I have answered a good many inquiries in the past year from dealers who wished to know about our association, but they would invariably decide to wait until this year before joining. I hope they have not changed their minds.

I notice that the Missouri Association is offering an inducement to the traveling men to get their customers to join their association and I think the idea is a good one and worthy of our consideration. We have about 1000 retail Hardware dealers in this State and we ought to have a majority of them on our membership list. At the third meeting of the North Dakota Association the secretary reported nearly 60 per cent. of the dealers in that State as members and that they were right after the other 40 per cent.; but it takes more than the secretary to do this, we want every member to feel that it is his duty to get other members and to send to the secretary any such matters that occur to them that would be of interest to our association.

There are at present 16 organized retail Hardware dealers' associations in the United States and a movement is being made to form a national association. Our president has received an invitation to a meeting in Chicago on February 12 to perfect the organization.

Committees Appointed.

An Auditing Committee was appointed by the chair, consisting of J. H. Foucht, North Topeka; Oscar Rohr and W. E. Culver, Topeka, and E. I. King of Logan.

The Committee on Resolutions consisted of J. H. Hamilton, Arkansas City; R. F. Kelterman, Velits, and D. H. Forbes and W. S. Chaney of Topeka.

A paper was then read by J. F. Berger of Anthony on

Credits in the Retail Business, How to Control Them.

Credit is a term in political economy of which we possess no scientific definition. The practical meaning, however, is well known. The proper conception of credit is that which serves the purpose of capital. It can only do so while there is capital ready to come and take its place when necessary. Credits which are not in this position do not accomplish the purpose of capital.

The practical position of credit in the retail business is exemplified by a sponge saturated with water: Squeeze it and you can "throw up the sponge." Credit is imposed upon a community for two very good reasons: Lack of money and greed of gain. The larger part of credit granted in the retail business is given to those anticipating the future—till they raise a crop——and is unsafe, while the part given to those of known responsibility is practical and usually safe.

The retailer who runs his business like a pawnshop, taking in everything, and charging more profit for the larger risk, must come to grief. I venture the assertion that in every town of 2000 population in the United States there is continually an outstanding credit of $50,000 which no single creditor desires.

Why is this true? Because very few dare to declare for cash only, single handed, and concerted action is practically impossible.

Many retailers, before they have been in business six months, have their

ENTIRE INVESTMENT CREDITED OUT,

doing business on jobbers' goods entirely. When, for any reason, they are forced to meet their obligations, they learn for the first time the real meaning of credit. Under existing circumstances credits have been shortened and discounts cut down to the retailer. If he is wise he will follow the good example set him by those closer in touch with the needs of the hour than he. Each successive season credits are more closely investigated by the credit men and it is to be hoped they will succeed in weeding out the old fogies, who, following antiquated methods, finally go to the wall, beat the jobber and leave a stock of goods to be disposed of to the ruination of legitimate trade at that place for some time.

HOW TO CONTROL CREDITS.

The control of credit in retail business is of much greater importance than the signification of the term. It depends so largely upon the personality of the merchant that anything but the most arbitrary rule strictly adhered to must fail of usefulness to many. Standing behind the counter and coming in personal contact with each customer, who in many instances is friend or neighbor, makes a correct business attitude more difficult than that of the credit man at his desk. Certain it is that you possess a more accurate knowledge of your customers, but more certainly it is a fact that a proper consideration of all the conditions, which must be considered and acted upon instantly, is more difficult, *except it be an absolute refusal of credit.* I am speaking now of customers known to you not to be prompt and legally responsible. Properly controlling credits is

THE MERCHANT'S NIGHTMARE.

Whether he be careful, conservative and painstaking, or careless and slothful, the credit portion of his business brings him more sleepless nights and gray hairs than all other business cares.

RULES IN GRANTING CREDIT.

If I were obliged to leave my store in charge of clerks for a considerable length of time, I would lay down the following rules for them to observe in granting credit :

1. Open accounts only with persons of known responsibility.

2. Take title notes for one-half bill, demanding half in cash. Always have note recorded.

3. Trust no strangers unless account is guaranteed by some responsible person known to you.

4. Avoid opening accounts for less than one dollar.

5. Always set a day for payment.

6. Collect promptly as agreed.

7. Avoid long time sales.

These rules strictly followed would undoubtedly lose you about one-fifth of your trade, principally the undesirable fifth. If business men would follow such rules, it would tone up trade, make their daily life pleasanter, stop aggravating losses and be better for customers as well.

Finally: Controlling credit is a matter for individual action, and no information will benefit the merchant who cannot say No, or who insists on making such unsafe sales for the chances of making a profit, which is as often as bad speculation as bucket shop deals.

SELL FOR CASH.

The real and only safe way to control credit is to sell for cash. Hasten the arrival of that day.

A paper on advertising, prepared by S. J. Gilbert of Arkansas City, was then read.

National Association.

Letters were read from the Iowa and Illinois Association upon the subject of forming a national association, and after due deliberation a committee was appointed to select a delegate to attend a meeting to be held in Chicago to consider the feasibility of a national organization.

A general discussion of various grievances of the retail Hardware dealer closed this session.

Second Session.

The second session was opened by reading a letter of greeting from H. A. Gole, president of the Iowa Hardware Dealers' Association, regretting his inability to fill his place on the programme. Mr. Cole congratulated the organization, and urged that some action be taken in regard to the National Association.

Resolutions.

The following resolutions were adopted:

Resolved, That the Kansas Retail Hardware Dealers' Association request our Senators and Congressmen to use their influence and votes against all trusts and combinations.

Resolved, That we are opposed to the trusts and combinations of the present day, and will, as far as possible, deal in goods manufactured outside of them.

Mutual Insurance.

The matter of mutual insurance was brought up and very favorably discussed, and referred to a committee for further consideration.

It was recommended to the Executive Committee that they call the next annual meeting at Kansas City, Kan., two days previous to the convention of the Implement Dealers' Association.

Officers Elected.

The election of officers for the ensuing year resulted as follows:

Frank Rudy, Paola, president.

George F. Anderson, St. Marys, vice-president.

J. A. Cole, Topeka, secretary-treasurer.

EXECUTIVE COMMITTEE.

James H. Hamilton, Arkansas City.

W. S. Chaney, Topeka.

E. I. King, Logan.

J. F. Berger, Anthony.

Miles Boyle, Garnett.

Iowa Retail Hardware Dealers' Association.

A stirring appeal to the members of the Iowa Retail Hardware Dealers' Association has been issued by Mrs. Henrietta E. Kupper, of Burlington, the indefatigable and enterprising secretary. The circular refers to the annual meeting in February, and the importance of having as many merchants of the State as possible at the gathering in order to adopt measures for the protection of the retail trade.

The programme for the annual meeting which will be held at the New Auditorium in Des Moines, and cover three days, is as follows:

The convention will open on Wednesday morning, February 14, at 10.30, with a meeting of the Executive Committee. The afternoon session will begin at 2 o'clock with the enrollment of new members. The president's address will follow, after which there will be reports from the secretary, treasurer and committees. A paper will then be presented by Senator E. G. Penrose of Tama on the subject of "Benefits to be Derived from Membership in this Association." At the evening session a number of ten-minute papers on topics of special interest will be read by E. H. Morris, Cedar Rapids; C. W. Breesford, Villisca; Frank L. Anderson, Webster City, and G. W. Huber, Olin. Discussion of the papers will follow.

Thursday morning, February 15, the session will begin at 9 o'clock, with several ten-minute papers. S. R. Miles, Mason City, will present one on "Co-operative Buying." Mr. Miles will be followed by E. A. Rea of Corydon on "My Methods of Advertising;" Jos. Mattes, Odebolt, on "Co-operative Insurance," and C. M. Doxsee, Algona, on "Window Advertising." Following discussion of these matters the Question Box will be opened and its contents disposed of. Election of officers for the ensuing year will close this session. The afternoon session will be devoted to a consideration of questions of mutual interest to the retailer, jobber and manufacturer. A number of jobbers and manufacturers have signified their intention of being present to participate in the discussion.

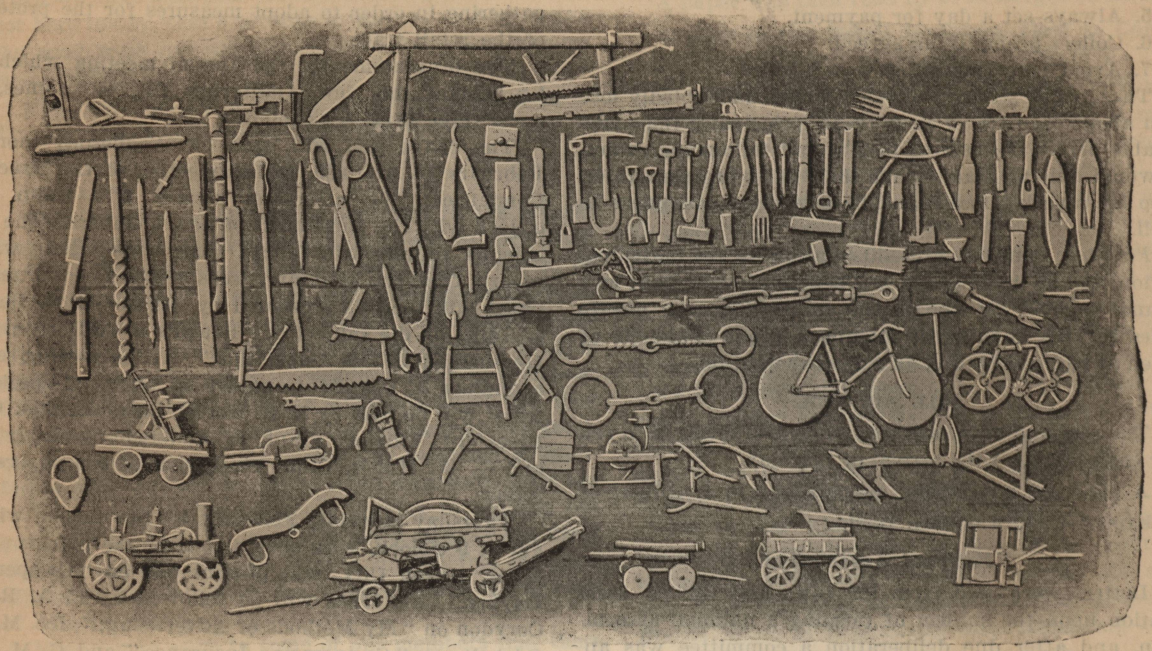
Friday morning, 16th, the delegates will again assemble at 9 a.m., when the regular association committees will be announced. The work of the association during 1900 will be the principal business of this the closing session, and definite plans will be decided upon to carry out the objects of the organization and promote the welfare of the retail merchant. In the afternoon the delegates will attend one of the sessions of the Legislature.

The Andrew B. Hendryx Company, New Haven, Conn., issue a combined catalogue of Bird and Animal Cages, Cage Specialties, various kinds of Chain such as Curb, Safe, Ladder, Plumbers', Safety and Single and Double Chain, in bronze, brass, steel and iron. It also contains Wire Picture Cord made of bronze, brass and tinned wire, making a total of 175 pages. Bound with this is another catalogue of 115 pages, devoted exclusively to Fishing Reels. The book is handsomely printed and bound, the Bronze, Brass and other goods appearing in *fac-simile* colored inks, according to the material they are made of. An important line of goods is thus very attractively presented to the trade.

The Kilbourne Mfg. Company, Fair Haven, Vt., have opened an office at 90 Chambers street, New York, which will be under the charge of C. E. Peabody. A full line of samples of their Wire Goods and Specialties for household and stationers' use will be shown. The company state that their goods and prices are made with a view of gaining and retaining trade.

The Whittler's Paradise.

The accompanying illustration relates to a unique display which recently appeared in the show window of William Sterne & Co., Owensville, Ind., who carry General Hardware, Stoves, Tinware, &c. During the rainy days and long winter evenings customers would gather around the store to swap stories and gossip and discuss topics of common interest. On one of such occasions a member of the party whittled out a Scythe and Snath. That fired the ambition of the party, and from this beginning grew a collection of 25 pieces, whittled with Pocket Knives from soft pine box lids. These were assembled on a board, such as Planished Iron is packed with for shipment, and the display placed in one of their windows. It attracted considerable attention from pedestrians, especially as they became interested in noting the different articles added from time to time by the deft fingers of the ingenious whittlers. The display covered a space 28 x 60 inches, and was instrumental in directing attention to the business of the firm.



An Exhibition of Whittling.

Detachable Letters and Figures.

Burdett & Johnson, 116 Broad street, Boston, issue a pamphlet describing self fastening detachable sign letters and figures, patented, which they are manufacturing. It is stated that these are made of metal, highly enameled in various colors. They have a raised or domed body combined with a self fastening device. This device consists of V-shaped prongs on the back which do not show when the letters are in use. They are readily attachable to and detachable from any kind of cardboard or other flexible material. For permanent signs the prongs can be clinched. They are referred to as particularly adapted for making show cards and price cards.

J. F. Bigelow, Worcester, Mass., manufacturer of the Bigelow Wire Fly Killer, has issued an attractive pamphlet referring to this article, which is well known to the Hardware trade. The pamphlet is fancifully illustrated and contains an original parody on "Will You Come Into My Parlor? Said the Spider to the Fly." We are advised that over 500,000 of these Fly Killers were sold last season. A convenient display frame is furnished for the Hardware trade, making an attractive summer line. The Wire Fly Killer, it is stated, kills but does not crush the fly, and will not scar or mar the most delicately tinted paper. Trade samples and prices are furnished on application.

Ideal Broiler and Toaster.

The Ideal Gas Stove Utensil Company, 73 Murray street, New York, are offering a broiler and toaster, as herewith shown. In Fig. 1 is illustrated the broiler, while Fig. 2 shows the toaster, both of which are designed for use in connection with gas, oil and vapor stoves. The broiler is made of steel wire, with a perforated sheet steel bottom, which is set directly over the flame, to give perfect diffusion to the heat and to act directly on a corrugated steel sheet upon which the meat is placed. The broiler may be adjusted in hight according to the intensity of the heat to prevent the meat from direct contact with the flame, gas or smoke. At the end of the broiler a drip pan is attached to catch and retain the juices of the meat. The point is made that it is not necessary to hold the broiler while in use, that it will broil perfectly, leaving no taste or odor from the gas, oil or vapor used, and that it is simple in construction, durable and easy to use. If desired for toasting the corrugated steel sheet may be turned over to one side, like the cover of a book, exposing parallel wires upon which the bread may be placed.

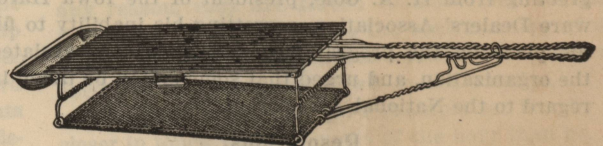


Fig. 1.—The Perfection Broiler.

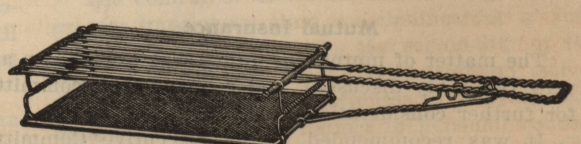


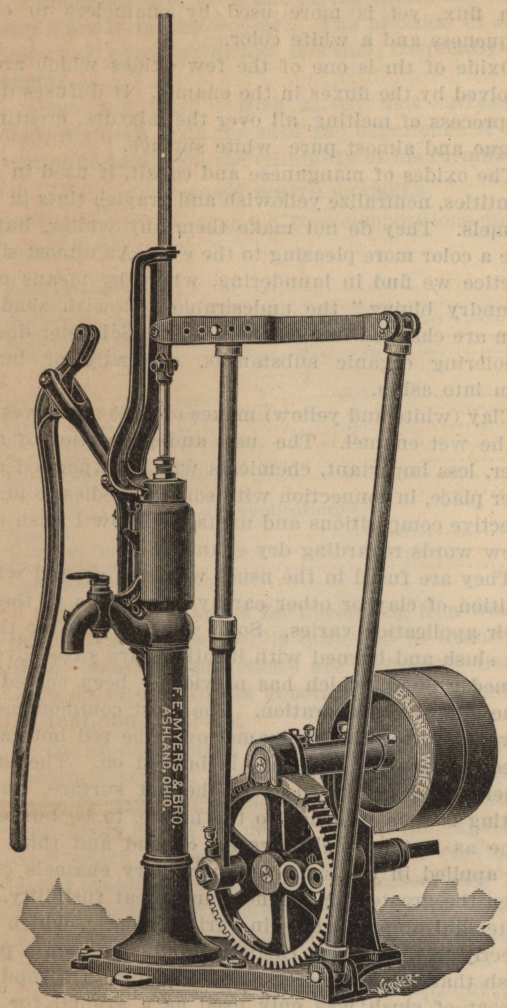
Fig. 2.—The Perfection Toaster.

The toaster, Fig. 2, is a modification of the broiler. It has a fine screen wire bottom instead of a perforated steel bottom to diffuse the heat, and parallel wires at the top upon which to place the bread.

E. L. D. Hester, 54 Warren street, New York City, has been appointed New York representative of the Towel Rack & Novelty Mfg. Company, of Providence, R. I.

Myers' Combination Pumping Jack.

F. E. Myers & Bro., Ashland, Ohio, are manufacturing the Myers Combination pumping jack, as here illustrated. This device is attached to a common pump standard and is rigged for belt power for operation by gas, steam or other engine. This pumping jack is self contained, being fitted with face plate, with an adjustable stroke of 5, 7½ or 10 inches. This, in connection with the adjustable walking beam, allows of a stroke varying from 5 to 16 inches. The periphery of the face plate is fitted with cogs, which engage a pinion operating a 65 pound balance wheel. The motion of this balance wheel carries the piston over the dead points in a regular movement and prevents the rebounding of the horse-power lever, an important advantage said to be peculiar to this jack. It will be seen there is a loose pulley, the balance wheel operating as a tight pulley, these pulleys being 12 inches in diameter and 3½ inches face. The concern also make a similar device, the same in every respect except that it is intended to be used in connection with horse-power or wind mill or both combined. It is often the case that a wind mill is not available owing to lack of wind, in which event the Myers Combination pumping jack can be attached to the pump standard and be operated by horse-power by detaching the wind mill, thus being able to alternate wind mill or horse-power as occasion requires, while in addition the pump can be operated by hand independent of the various kinds of power. The pumping jack can be supplied either with or without stand, and is designed to be used in connection with any ordinary pump standard.



Myers' Combination Pumping Jack for Power.

JAMES LANE, who for nearly nine years has been tinsmith with D. M. Morton, Holly, N. Y., will enter into partnership, in the hardware business, with E. J. Fuller, of Kendell, N. Y., on February 1.

Stove and Hardware Dealers.

J. P. FUTRELL and R. L. HARDY, under the style of Futrell-Hardy Hardware Company, embarked in business January 1, at Scotland Neck, N. C. Besides a general line of Hardware they are handling Stoves, Mill Supplies, Lime, &c. They will appreciate copies of catalogues, price-lists, &c., from the trade.

J. H. NIEMAN has opened a general Hardware, Stove and Tinware store at Sunman, Ind., and would be pleased to receive catalogues, price-lists, &c., from manufacturers and jobbers.

THE OHIO WRINGER COMPANY, Springfield, Ohio, market their entire product of Clothes Wringers through the retailer as a distributing medium, ignoring entirely the middleman. A favorite theory with them is that for their particular product this procedure obtains much better results, in proof of which they recall that a large portion of their trade are customers of 20 years' standing. Among the claims made for their Wringers are their attractiveness, durability, quality, reasonableness in price and the fact that they are withheld from jobbers, and are profitable to exclusive agents, whom only they seek.

LEECRAFT & KING are successors to H. N. Roberts in the Hardware, Stove and Agricultural Implement business at Colbert, I. T.

CHAS. A. WATTS has succeeded A. P. Jacobs in the Hardware, Stove, Farm Implement and Sporting Goods business at Paullina, Iowa.

L. F. STAHLER is successor to Stahler Bros., dealers in Hardware, Stoves, Harness, Farm Implements, Vehicles, &c., Waverly, Ohio. This business was etablished in 1867 by David Stahler.

E. H. CHEEVER has lately entered the retail Hardware, Stove, Tinware, Farm Implement and Sporting Goods business at Langlois, Ore.

T. W. BLEACH has succeeded Phillips & Bleach in the retail Hardware, Stove, Farm Implement and Plumbing business at Kearney, Mo.

G. M. WEBBER, East Bridgewater, Mass., dealer in Stoves, Hardware, Tinware, Furnaces, Plumbing Goods, &c., is expecting to enlarge his establishment for the purpose of adding a line of Furniture.

A. A. ANDERSON has disposed of his Hardware store in Juneau, Alaska, and will enlarge his store at Skaguay, to which he will hereafter devote his entire attention. Mr. Anderson handles in a wholesale and retail way Shelf and Heavy Hardware, Stoves and Tinware, Sporting Goods, Bicycles, Fishing Tackle, Steam Fittings, Saddlery Hardware, Chandlery, &c. His building is a new one, with plate front, and cost $3500. It is 28 x 70 feet, two stories high.

A. S. KING, formerly the New York manager for Matthai & Ingram, and who since the incorporation of that firm in the National Enameling & Stamping Company, has been in the New York City office of the last named concern, has been transferred to Baltimore, Md., to take charge of their branch in that city.

W. H. BARNARD & Co., Norfolk, Va., are meeting with great success in the sale of their Duplex Broiler.

L. B. HANTZ has purchased the property, 329 West Market street, York, Pa., to where he will remove his store and tin shop from 403 West Market street, about March 15.

The Turner Company have established a plant at 2631 Archer avenue, Chicago, in which they have invested $25,000, for the reduction of garbage. The garbage is cooked, chopped, strained and pressed into an odorless residue, which, it is claimed, can be used as a fertilizer.

Enameling Cast Iron.*—II.

BY J. VOLLKOMMER.

THE OUTER OR SURFACE ENAMELS.

These enamels are of a glasslike composition and appearance and can be semi-transparent or opaque. They are applied directly to the ground and are supposed to fuse to it, forming a perfectly uniform, smooth and glossy surface, hence must possess a lower melting temperature than the ground. Yet it is not well to use enamels that fuse too easily, as they will not dissolve the metallic oxides equally, and we find on melting such compositions in a pot that the upper half of its contents may be only semi-transparent, while the enamel near the bottom contains (owing to their greater specific gravity) nearly all the oxides, especially those of tin. These enamels, particularly when applied dry, cannot produce a surface of uniform appearance. Such enamels can be improved by replacing part of the oxide of tin by bone ash, which, on account of its lightness, mixes easily with enamels of almost any composition, and lessens their fusibility. Bone ash alone makes no white opaque enamel, but will give it a semi-transparent appearance. The use of white lead to obtain opaque enamels is not commendable, since it renders them very susceptible to chemical influences. For instance, raw eggs, if left in a pot thus enameled, will after a while produce discolorations on its surface, caused by the formation of sulphate of lead; likewise a solution of vinegar destroys all gloss and dissolves part of the enamel, leaving a highly poisonous lead compound as sediment. Lead, as silicate of lead forming a glasslike compound, is less objectionable, since it is less soluble. The raw materials needed for our purpose may be divided into:

1. Those producing the body or glass (silica and alkalies).

2. Metallic oxides and other materials imparting opaqueness and coloring.

3. Materials used for the regulation of fusing temperature, and such as are intended for rectifying defects or neutralizing certain colors.

Many of these elements have been already referred to in connection with the slush or ground enamels. The most essential of them and their salient qualities are:

The silica (quarz, flint and sand) contains up to 99¾ per cent. pure silicon, and if they could be fused to the metal under ordinary conditions would be the ideal enamel. Since this is not practicable, they have to be fused by means of bases, and thus form transparent silicates or glass. Silica renders enamels hard and impervious to chemical action. The so-called acid proof enamels are those containing a comparatively high amount of silica. Too great a percentage of the latter, however, interferes with the fusibility of the mixture.

The alkalies or bases serve as fluxes, dissolving silica if heated with it. Soda and potash are, for us, the most important of this group. Soda (enamel soda) is used crystallized or calcined. Both produce the same result, but the enameler must bear in mind that 100 parts of soda in crystals are equivalent to only about 37½ per cent. of the same calcined. Soda is also used to highten the gloss. Potash, aside from its qualities as a flux, increases the resistance of enamels to mechancal action. Its use is commendable in connection with lead enamels.

The earth alkalies (lime, chalk, carbonate of magnesia), if melted together with silicates, render them insoluble in water; they are necessary in every glass or enamel. For the silicates of lead, any oxide of the latter may be used; however, red lead or minium (its highest oxide) is preferable for better grade enamels. If used in too large a proportion to the silica part of the oxide will get reduced to metallic lead, discoloring often the entire batch of enamel. If molten mixtures of white enamel show streaks of a darker color, as if affected by smoke, partly reduced oxide of lead is the cause of it.

Borax, consisting of boracic acid and sodium, fuses at a dark red heat to a transparent glass. Added to enamels, it renders them softer and easier fusible. It dissolves nearly all metallic oxides, diffusing them equally over the entire melt. This latter quality accounts for its presence in most enamels.

Feldspar contains silica, soda or potash and a small percentage of alumina. It acts not so much as a flux, but is used rather to replace part of the silica and alkalies in some mixtures. Alone, it fuses in a bright red heat to a translucent, glasslike product. Fluorspar (composed of calcium and fluor) replaces lime or other calcic products, and acts also as a powerful flux.

Cryolite, consisting of soda and kaolin, serves also as a flux, yet is more used by enamelers to obtain opaqueness and a white color.

Oxide of tin is one of the few oxides which are not dissolved by the fluxes in the enamel. It diffuses during the process of melting, all over the mixture, creating an opaque and almost pure white surface.

The oxides of manganese and cobalt, if used in small quantities, neutralize yellowish and grayish tints in white enamels. They do not make them any whiter, but produce a color more pleasing to the eye. An almost similar practice we find in laundering, where by means of the "laundry bluing" the undesirable yellowish shades of linen are changed into a bluish white. Saltpeter destroys discoloring organic substances, oxidizing or burning them into ashes.

Clay (white and yellow) makes opaque and gives body to the wet enamel. The use and properties of a few other, less important, chemicals will be explained at another place, in connection with some remedies to improve defective compositions and melts, and now I wish to say a few words regarding dry enamels.

They are fused in the usual way and ground without addition of clay or other earthy substances to the mill. Their application varies. Some are strewn over the yet wet slush and burned with it, others are sifted over the burned ground, which has previously been coated with some adhesive preparation. The most common method, however, is to sift the enamel over the red hot casting, directly after its first coat is burned on. The enamel adheres and partly fuses to the hot surface, and the casting is then returned to the muffle, to be burned the same as wet enameled ware. Second and third coats are applied in the same manner. Dry enamels can be given the greatest opaqueness and great fusibility. The writer did prepare some (in various colors), which fused directly to the red hot casting, producing such a perfect finish that smaller pieces did not require a second heat. A coat of slush was only used as a ground for white enamels, but even then the entire operation of enameling was done in one fire.

The composition of dry enamels differs greatly. Some soft kinds contain almost equal amounts of silica and oxide of lead. When the latter is dispensed with, the amount of fluxes used (borax, soda, &c.) should not be less in weight than that of the silica. Saltpeter is in all these enamels a very necessary element, and some contain up to 10 per cent. of it.

REMEDIES.

The following simple remedies, if applied properly, will correct some defects of enamels:

If wet enamel is too thin and adheres imperfectly to the casting, add some carbonate of magnesia.

If wet enamels have a tendency to settle in their basins, add Epsom salt, also a small amount of carbonate of magnesia and some clay.

If the enamel is too hard, add either borax, potash, oxide of lead, or the two latter chemicals together.

If enamel is too soft, diminish the fluxes, add to the mill some carbonate of magnesia, quartz and clay. Opaqueness and a white color are improved by adding oxide of tin. Too much of it, however, softens enamels

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and makes them far less efficient against chemical action.

If the ware lacks gloss, add more soda to the mixture.

Small specks of a darker color (especially in white enamels), if of organic matter, can be oxidized with the help of saltpeter.

How yellowish tints may be corrected by means of the oxides of cobalt and of manganese has been explained already.

If enamel chips easily, use some Epsom salt or carbonate of ammonia with the mixture, or add some to mill while grinding it. Carbonate of ammonia is also considered an efficient remedy against the formation of fissures and cracks.

Pin holes are the result of the formation of gases in the already molten enamel. The addition of some saltpeter or other oxidizing medium frequently prevents them.

Last, not least, I wish to say that success depends fully as much upon the skill and experience of the enameler as it does upon the reliability of his formulas.

SOME WHITE ENAMELS.

Below will be found a few compositions for a white enamel:

1

Sand or quartz	8.1
Borax	5 to 6
Saltpeter	2 to 2.5
Cryolite	3 to 3.5
Glass (ground)	7 to 8

2

Quartz	37
Borax	24
Oxide of tin	25
Carbonate of soda	10 to 11
Saltpeter	10
Carbonate of magnesia	4 to 5
Oxide of lead (white lead)	12 to 18
Ground with (for wet application)—	
Quartz	6
Oxide of tin	3 to 4
Carbonate of soda	0.5 to 1
Carbonate of magnesia	0.75 to 1

The use of enamels for decorating iron ware, such as stoves, fire places, &c., is quite old in France and Germany, where such articles are frequently treated so as to harmonize with the general decoration and the room they are intended for.

On all ornamental metal ware, and that in particular which is exposed to sudden changes of temperature, the enamels must form the thinest possible coating, which will easily follow all movements of the expanding metal and which will not hide any delicate carving or other relief ornamentation. Several processes may be resorted to. If such ware receives a white ground and upon this a thin coat of some transparent colored enamel, an effect may be produced similar to that of glazed terra-cotta, majolica or other pottery ware. On account of the whitish ground all projecting parts of the relief appear several shades lighter and the deeper sections of a more intense and somewhat darker color. Gold need only be sparingly applied so as to set off the several parts to advantage, for the beautifully diversified coloring of all relief work does not require much gold.

Enamels of an almost similar composition, but of opaque nature, give colors of uniform shades and, as a rule, do not require slush or ground coats. Another class of enamels, which the Germans term "Kunst-Emaille" (Art Enamels) is applied to the metal with brushes, almost like oil paint. According to their composition, either glossy or matt (dull) velvet-like effects are obtained. The colors may be freely blended, and thus it is within the means of the decorator to follow any design and produce articles of artistic merit.

These methods of enameling, which combine durability with decorative qualities, are more and more employed, and soon may lead to a flourishing industry.

We must not forget that enameling was first employed as an art to enhance the value of jewels and, on account of its durable qualities, for the reproduction of pictures, and comparatively lately only as a coating for the protection of metallic surfaces.

(THE END.)

Entertainment and Reception of Brooklyn Master Plumbers.

The annual entertainment and reception of the Brooklyn Branch of the Association of Master Plumbers of the City of New York was given at Arion Hall, Brooklyn, on Wednesday night, January 17, and was the occasion of a large assemblage of plumbers and their friends. The committee, composed of Edward Macdonald, Harry M. Noble, Eugene S. Kelly, William Eirman, John A. Ebel and William J. Piercy, Jr., had provided a two-part programme of seven numbers each. None of the soubrettes, singers or comedians pleased the audience as well or received the applause given Harry M. Noble, who appeared as a plumber's helper and related his experience in visiting the shops of the different members. The professionals also pleased the members and guests, and brought many congratulations to the committee.

After the entertainment the dance cards were distributed, and the grand march was led by President M. F. Gleason and lady. Among those present were President Harry M. Noble of the Association of Master Plumbers of Greater New York, President I. J. Brown and I. C. Shumway of the Manhattan branch, President Perry from Queens, Thomas Radcliffe, George W. Smyth, D. Donegan, Eugene S. Kelly, Joseph Killian, Charles Schwenken, Fred Schluchtner, E. Macdonald.

The wholesale houses represented were the Abram Cox Stove Company, by F. Bedell; George P. Jacobs Company, by William Martin; Thomas G. Knight, by R. Eggleston; Ronalds-Johnson Company, by F. Boardman; T. Delaney & Co., by T. Delaney; Renton Brass Company, by J. Renton; H. P. Read Lead Works, by T. James, and Spencer, Haviland & Co., by S. Haviland.

The Floor Committee was composed of Eugene S. Kelly, William J. Piercy, Jr., Charles W. Evans, Joseph P. Killian, Edgar L. Abrams, William M. Brown, S. L. Corcoran, W. L. Dixon and Chapman S. Reeves. The Reception Committee was composed of F. Schluchtner, Thomas Kelly, John Bosle, Thomas Radcliffe, Martin Fallon, George W. Smyth, John W. Kelly and L. Gfroeher.

A supper was served at 1 a.m., and the sparkling refreshments were matched in brilliancy by the wit and wisdom of the hosts and guests. The entertainment of 1900 will be remembered as a delightful occasion in the memory of all who were present.

Joseph A. Ingalls.

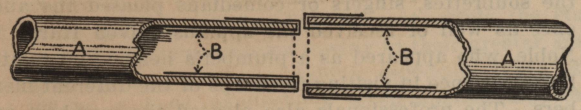
Joseph A. Ingalls died at 3 o'clock Monday morning, January 15, at the Hotel Berkley. He was the senior member of the firm of Ingalls & Kendricken, steam heating apparatus, at 80 Sudbury street, Boston. He had been in rather poor health for a long time, but had not been confined to his apartments, and was at his office as late as last Saturday. Colonel Ingalls belonged to a well-known American family, the earliest member of which came over in the Mayflower and has his name inscribed on the monument at Plymouth. He was 58 years old.

AT THE MEETING of the Engineers' Club of Columbus, Ohio, Saturday evening, January 6, a committee was appointed, with Dr. C. O. Probst chairman, to draft a bill regulating plumbing in the State of Ohio. This bill is to be indorsed by the United States Geological Survey and will be introduced in the Legislature under its supervision some time during the present session. Prof. Albert A. Wright of Oberlin College is really the father of the bill, and it was through him that it was brought up for discussion before the Engineers' Club. After submitting the bill to several of the plumbing associations of the State Dr. Probst will report on it to the Engineers' Club.

Joint Wiping on Copper Pipe.

BY HELMAR.

A few lines descriptive of a feature affecting the life of joints wiped on distillery copper pipe work will be of interest to some of the craft who, although called upon occasionally to perform such work, do not have sufficient practice to enable them to acquire the thorough knowledge of vital points essential to durable work. Having had considerable practice and ample time to watch results from joints wiped on copper pipe made ready for wiping



Joint Wiping on Copper Pipe.—Fig. 1.—Pipe Ends Prepared for Wiping.

in different ways the writer feels safe in recommending the following conclusions as a guide in preparing cleanings for such joints:

Proper proportions of the metals used in making the solder, cleanness of solder, firm and solid "patting up" when forming the joint and a sufficient thickness of solder at all points to insure the joint withstanding the highest internal pressure and roughest handling the pipe may be subjected to are as necessary in joints on copper work pipe as on lead, regardless of what the pipe is to be used for or its greater stability under strain.

The length of wipe joints on copper pipe should be and invariably is greater than that of joints made on lead pipe. Wipe joints on lead, especially those on supply pipe, are often longer than necessary, but on lead soil and waste pipe the joints are as a rule made as short as consistent with sound work on account of the saving of solder—the average length on large pipe being from one-half to three-quarters the length of joints on $\frac{5}{8}$-inch supply pipe.

On copper pipe, say from 2-inch diameter up, the length of joints varies from $2\frac{1}{2}$ to $3\frac{1}{2}$ inches, sometimes 4 inches on 4, 6 and 8 inch pipe. Joints of these lengths rule, partly because coppersmiths are not as neat and trim with the joint wiping branch of their business as plumbers, partly because kindred craftsmen forced into service in sundry emergency cases cannot produce the ideal joint on material not only foreign to their regular

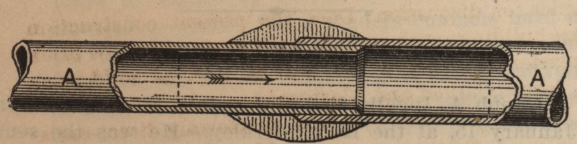


Fig. 2.—Section through Finished Joint.

work but often under conditions they are not familiar with, and partly because copper piping is permanently installed in a way that leaves it self dependent for support to a degree that no plumber would dare trust lead work.

The shortest, lightest wipe joint one can possibly make on lead pipe and yet preserve a creditable degree of uniformity will give lasting service. This is not true of a wipe joint on copper pipe, for while reasonable length and thickness are necessary to have it stand pressure and strain the maximum time of service does not depend upon any length or thickness of joint within practical or rather commercial limits.

On distillery copper pipe work, where the cleaning for the joints was limited to the cleaning and tinning of the outside of the ends only to the extent of the length of the joints, the life of the joints has been entirely too short, lasting in some cases only from four to six months before leaking through between the solder of the joint and the surface of the pipe covered by the joint. This feature has been noticed on many range connections where brass, lead or iron has been wiped on to copper. On both lines of work this defect appears more frequently where the copper tubing has a brazed seam. Therefore the workman should be unusually careful in cleaning and tinning brazed seams.

Where joints on copper pipe have been prepared for by cleaning and tinning 6 or 8 inches of the interior of the pipe on each end and across the wall of each piece in addition to the usual tinning outside the work has endured severe service for many years without leakage at any point. Without considering the position, location or kind of service the pipe is under the results of the two ways of preparing the ends for a joint are conclusive evidence that the extent of the tinning determines the time a joint will last. Joints have been cut apart after years of service, where the cleaning was known to have originally been tinned across the end and back into the pipe fully 8 inches, and the tinning was found to have been reduced from one-half to one-quarter of the original length, and in some cases back to the solder of the joint itself. The appearance of different joints shows that a corroding action takes place at the end of the tinning and destroys the tinning little by little until the union be-

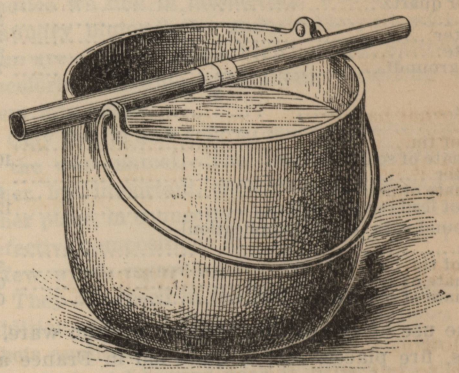


Fig. 3.—Pipe Over Solder Pot.

tween the pipe and the solder of the joint is broken. After the tinning on the inside has been eaten away up to the joint the separation of the joint from the pipe is probably retarded on account of the extra thickness of metal to be contended with.

This theory is supported by the fact that in the majority of cases the life of a joint well made on extended tinning is long when compared with the average time required to destroy the tinning on the inside of the pipe. For this reason the writer is careful not to wipe the interior tinning too clean; that is, a slight thickness of metal is preferred to leaving barely enough solder to cover the surface of the copper. It is essential that the tinning on the inside of the pipe be perfect. A single spot not tinned is a break at which the destruction of the tinning will begin immediately, and where any such spot occurs the tinning further from the end than the spot is practically valueless in preserving the life of the joint.

Fig. 1 represents two pipe ends, A A, cut away to show a section across the diameter. Lines B B indicate the tinning for the joint, extending also across the wall and back into the pipe, as described in the foregoing.

Fig. 2 shows the tinned ends slipped together and ready to receive the joint, the form of the finished joint being indicated by the dotted section. Slipping the end of one pipe into the other strengthens the pipe at the joint and no doubt arrests corrosion of the tinning to a certain extent after it reaches the lap. If sufficient lap is given it makes the pipe stiff enough to handle before the joint is made, which is a great convenience to the workman where the pipe is portable enough to handle during the wiping process.

Copper pipe cannot be burned by pouring hot solder on it as lead can, hence where practicable the cleaning is often placed over the pot, as shown in Fig. 3, and solder poured over it in abundance until a "heat" is gotten up.

This cannot be done with lead and brass, because the lead would melt and brass would part with some of its zinc, which would utterly ruin the solder for wiping purposes. The ability to pour hot solder on copper with impunity is a feature more valuable than one unacquainted with such work would imagine. Much more heat is necessary to get a copper cleaning ready to wipe upon than is the case with lead, and drawing a heat on copper with the skill and care essential in lead work would occasion much annoyance and loss of time.

Where work is heavy or fixed, or for any reason it is not advisable to move it, solder may be poured rapidly over the cleaning from a large ladle and caught on a grain scoop, as shown in Fig. 4. When 10, 20 or 30 pounds (according to the size of the pipe) of mushy, semi-liquid solder has been caught it can be dumped on top of the cleaning; if hot enough to settle and drip off it can be replaced again and again until it does stick. When the solder sticks it can be poured down with a fresh ladleful from the pot. In this way a thorough heat is obtained, and then, with the aid of a bulk of mushy solder from the

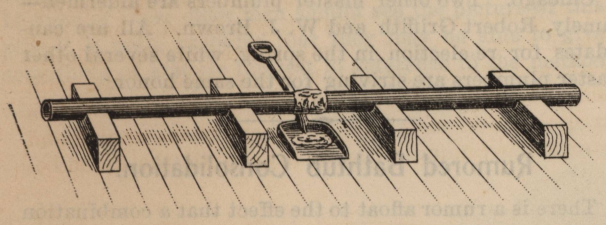


Fig. 4.—Wiping Heavy Work.

scoop and what has been kept on the pipe with the wiping cloth, a perfect joint can be formed on pipe of any size. If the joint is too large to clean up and form with one cloth use two and do the wiping with the one best suited to it.

HAIR FELT PIPE COVERING.

BY J. L. BIXBY, JR.

The following tables give square feet of stock required and length to cut stock for covering pipe with asbestos paper, ¾-inch hair felt, sheathing paper and then canvas cover. This table has been in use now for over five years and the measurements given will be found absolutely correct.

Square Feet of Stock Required per Lineal Foot of Pipe.

Size of pipe.	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6
Asbestos paper...	0.3	0.35	0.48	0.52	0.60	0.73	0.85	1.00	1.15	1.30	1.57	1.85
¾-inch hair felt..	0.37	0.45	0.55	0.67	0.70	0 85	1.05	1.20	1.35	1.45	1.70	2.00
Sheathing paper.	0 70	0.80	0.85	0.95	1.02	1.20	1.35	1.55	1.70	1.85	2.13	2.30
Canvas.....	0.72	0.83	0.87	0 98	1.05	1.22	1.37	1.57	1.73	1.90	2.20	2.33

Length of Stock Required to Go Around the Pipe (in Inches).

Asbestos paper...	3⅝	4¼	5⅜	6¼	7⅛	8¾	10¼	12	13⅞	15⅝	18⅞	22⅝
¾-inch hair felt..	4½	5⅜	6⅝	8⅛	8⅜	10¼	12⅝	14⅜	16¼	17⅜	20½	24
Sheathing paper.	8½	9⅝	10¼	11⅛	12¼	12⅛	16	18½	20½	22¼	25⅝	27⅝
Canvas.....	8⅝	10	10½	11⅞	12⅝	14⅝	16½	18⅞	20¾	23	26⅝	28

Example showing use of tables.—Take, for instance, 20 feet of 2-inch pipe to be covered, stock required will be:

Asbestos paper, 0.73 × 20 = 1.46 square feet.

Three-quarter inch hair felt, 0.85 × 20 = 1.70 square feet.

Sheathing paper, 1.20 × 20 = 2.40 square feet.

Canvas, 1.22 × 20 = 2.44 square feet.

The width to cut the strips to encircle the pipe will equal for the

Asbestos paper, 8¾ inches.

Three-quarter inch hair felt, 10¼ inches.

Sheathing paper, 12½ inches.

Canvas, 14⅝ inches.

Note.—Wet the asbestos paper before you apply it and it will stay where put.

If the hair felt is wound with flat strips of cotton cloth it will hold its shape best.

Program of the Sixth Annual Meeting of the A. S. H. and V. Engineers.

We give below the program for the sixth annual meeting of the American Society of Heating and Ventilating Engineers, to be held at 12 West Thirty-first street, New York, on January 23, 24 and 25.

At the opening session on Tuesday at 2 o'clock, after transacting the regular business several interesting reports will be presented.

Tuesday Evening, 8 P.M.

Announcement by tellers of officers elected.

Paper on "Neglect of Ventilation of Some Hospitals," by Thomas Barwick.

Paper on "Dangerous Air Ducts," by John Gormly.

Wednesday Morning.

Inspection by invitation of J. W. Jackson, superintendent of the Park Row Building, of the heating, electrical and mechanical equipment of the building, between 10.30 and 12 o'clock. Members wishing to see the plant will meet at the building on Park row, New York, at 10 30 o'clock sharp.

Wednesday Afternoon, 2 o'Clock.

Paper on "Methods of Testing Blowing Fans," by Prof. R. C. Carpenter.

Paper on the "Calculation of Disk Fans," by H. Eisert.

Topics for discussion: What is the most practicable method of heating and ventilation for hospital wards?

Is there a recognized system of symbols for the marking of drawings for the designation of pipes, ducts, &c.? If not, should not a sign language be adopted for the interpretation of drawings?

Thursday Morning, 10.30 o'Clock.

Paper on "Condensation of Steam in Blower Systems of Heating," by Prof. R. C. Carpenter.

Paper on "The Removal of Dust from Boiler Rooms," by Albert A. Cary.

Topics for discussion: When heating by direct radiation should the radiator be placed close to an outside or an inside wall? Should they be placed between or before windows?

When testing radiators what should be considered the maximum allowable error in any one test of a series?

Thursday Afternoon, 2 o'Clock.

Paper on "The Rating of Steam and Hot Water Boilers for Heating Purposes," by James Mackay.

Installation of officers.

Topics for discussion: Does the present construction of large buildings with curtain walls made of hollow brick and plastered conserve the heat as well as solid brick walls, furred, lathed and plastered?

In heating factories is it wise to use only direct radiation without ventilation, or would it be better to use a forced circulation of warmed air?

What is the most efficient and economical manner of taking care of drips from steam systems where the condensation is not returned to the boiler by gravity?

Cannot a schedule be devised for the proper ventilation of toilet rooms in public buildings to avoid the use of deodorizing appliances?

IT IS REPORTED that several plumbers of Bridgeport, Conn., are suffering from lead poisoning. Treatment for cure should be given by a physician, but a hint how to avoid lead poisoning may be useful to the younger, careless and negligent members of the craft. It is simply cleanliness, particularly of the hands when eating. Plumbers who give some thought to keeping face and hands as clean as possible when working and who wash carefully so as to be thoroughly clean after work leave no trace of lead on their skins to enter the pores and poison the system.

Association News.

Ohio State Association.

The twelfth annual convention of the Master Plumbers of Ohio will be held in Youngstown on February 13 and 14 and delegates from all over the State will be in attendance. The hall in the Pabst Building has been secured for headquarters, where the sessions of the convention will be held. The delegates will be entertained by the local association.

New Haven Master Plumbers.

The Master Plumbers' Association of New Haven, Conn., at their annual meeting elected the following officers for the year:

President, S. E Dibble.
Vice-President, Clinton E. Coe.
Secretary, Theodore A. Potter.
Treasurer, T. W. Corbett.
Directors: T. W. Corbett, H. H. Guernsey, Edward A. Rourke, F. A. Curtiss and Thomas L. Routh.

Philadelphia Master Plumbers.

The annual meeting of the Master Plumbers' Association of Philadelphia was held January 11 in the Builders' Exchange and after electing the following officers for the ensuing year a banquet was enjoyed:

President, George F. Uber.
First Vice-President, A. M. Hicks.
Second Vice-President, S. W. Barnes.
Third Vice-President, A. G. Bond.
Fourth Vice-President, R. Drummond.
Fifth Vice-President, Wm. McCoach.
Secretary, W. S. Clark.
Treasurer, Wm. Harkness.
Sergeant-at-Arms, Samuel B. Fleming.
Board of Directors : S. Louis Barnes, J. E. Eyanson, E. Frank Paullin, C. W. Barnes, G. Wallace Smith, G. Drummond.

Cohoes Master Plumbers.

On January 9 the Master Plumbers' Association entertained President Westcott of the New York State Association, President Kerwin of the Albany Association and John E. Dugan. President Westcott assisted in installing the following officers for the ensuing year, after which a banquet was served and a social hour enjoyed with vocal and instrumental music:

President, A. G. Burbanks.
Vice-President, H. E. Bottum.
Secretary, E. V. Cady.
Treasurer, David Clark.

Pittsburgh Master Plumbers.

At the annual meeting of the Master Plumbers' Association of Pittsburgh and vicinity the following officers were elected for the ensuing year:

President, W. U. Williams.
Vice-President, M. Purtill.
Secretary, George Sands.
Treasurer, Frank McKnight.
Sergeant-at-Arms, M. Kenna.
Executive Committee: George Addy, J. J. Kennedy, C. S. Craig and John M. Addy.

The Chicago Plumbers.

The Chicago Master Plumbers' Association will hold its annual reception and ball at the Sherman House in that city on Wednesday evening, 24th inst. The Committee on Arrangements consists of A. C. Hickey, John F. Binder, E. C. Breyer, Joseph P. Heeney, Thomas P. Wade, C. S. Lawrence, Edward O'Shea and Charles W. Alcock.

The date thus selected comes very opportunely, as the Illinois Master Steam and Hot Water Fitters' Association and the Illinois Master Plumbers' Association meet in Chicago the same week. Their country members will thus have an opportunity to attend the reception without making a special trip to Chicago for the purpose. The steam fitters hold their opening session at 10 a.m. on the 22d inst. in hall No. 210, Masonic Temple. The plumbers begin at 10 a.m. on the 23d in hall No. 412, Masonic Temple. The latter had intended to meet at East St. Louis, but decided to change to Chicago.

The new officers of the Chicago Master Plumbers' Association were installed on the 9th inst. The retiring president, Charles J. Boyd, was presented with a permanent memento of his official position. This consisted of a gold locket decorated with a large diamond and bearing Mr. Boyd's monogram. P. M. Murphy, president of the National Association, made the speech of presentation in a very happy manner, to which Mr. Boyd responded. Mr. Boyd, by the way, is one of the Board of Aldermen of Chicago. Two other master plumbers are aldermen—namely, Robert Griffith and W. J. Brown. All are candidates for re-election in the spring, while several other master plumbers are striving for the same honor.

Rumored Bathtub Consolidation.

There is a rumor afloat to the effect that a combination of all the bathtub interests in the entire country will be attempted. This will include all classes of enameled tubs of the various manufacturers, steel clad bathtubs, copper lined tubs, all steel enameled tubs, solid copper tubs and hospital bathtubs. It will also include all the various styles and kinds of solid porcelain tubs, and in fact every plant turning out these goods, no matter in what shape or form. Prices, it is said, will be graded according to the quality, workmanship and general appearance of the tubs. The scheme is only in an embryotic state, but as it is within the bounds of possibility to round up the various interests, and as we have the information from a reliable source, there seems a likelihood that the plan will have a trial.

The Standard Sanitary Mfg. Company.

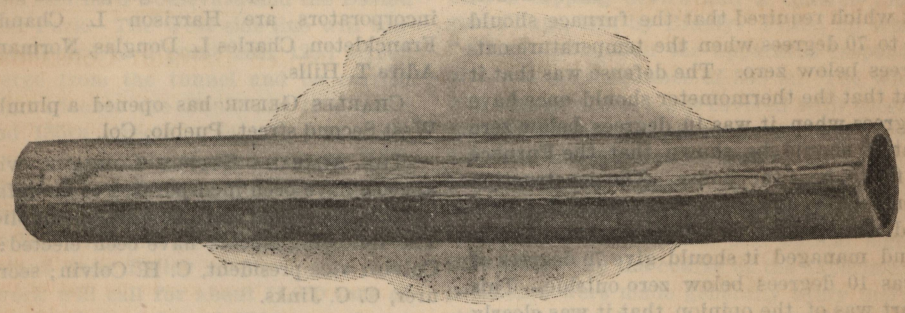
The organization of the Standard Sanitary Mfg. Company has been completed, with the officers reported in our issue of January 6, who form the Executive Committee. Theodore Ahrens, Jr., president, takes charge of the manufacturing plants; Francis J. Torrance, first vice-president, is chairman of the Executive Committee and head of the sales department, while W. A. Myler, secretary, acts as purchasing agent of the company. The finances of the concern are under the care of James W. Arrott, treasurer. The company's head office is in Pittsburgh. The various plants embraced in the consolidation will be known under their old names, as the Ahrens & Ott, the Dawes & Myler, &c., works of the Standard Sanitary Mfg. Company. The new company, it is stated, will build a large and complete plant to supply their Eastern trade somewhere within easy distance from New York. Trenton, N. J., is mentioned as a likely location for this plant.

The policy of the company will be to give considerable attention to foreign trade. An order has already been received from a German house for 2000 enameled bathtubs to be delivered within the next six months, and several other good orders from foreign countries are in sight.

THE AHRENS & OTT Soil Pipe plant at Louisville, Ky., purchased by the Central Foundry Company, is being removed to Anniston, Ala., and added to the capacity of the Tyler plant in that city, also owned by the Central Foundry Company. A part of the machinery is also being sent to Gadsden, Ala., to enlarge the Pipe mill at that place.

Lead Pipe of Other Days.

Those who do plumbing work at the present time are so accustomed to seeing a bright coil of lead pipe that they do not stop to ask how pipe was made in former times. Through the courtesy of G. W. Utton, Winsted, Conn., we have received a sample of the lead pipe of other days from which the picture shown herewith has been made. It is stated that the pipe was made in Canton, Conn., which some 50 to 75 years ago was a lead pipe making center. The pipe is of sheet lead, and where the two edges butt together it has been very securely soldered with a good quality of solder. This particular piece of pipe seems to be in good condition, and was in use until a short time since. The age of this pipe can be gauged from the statement of Mr. Utton that even when he was a "cub," 30 years ago, it was only occasionally found in doing repair work. Some of the old timers in the plumbing trade have informed Mr. Utton that this pipe was manufactured by Alanson Andrus of Canton, Conn. If some of these older men should see the picture of this pipe it is quite probable that they may be able to give something of historic interest in reference to the method of manufacturing and the method of working it. It is evident that this piece of pipe has outlived the original owners of the plant where it was made.



Lead Pipe of Other Days.

Fumigating Schools.

The schools of Scranton, Pa., have passed through a series of epidemics of children's diseases which made necessary a thorough fumigation. The method employed by Plumbing Inspector M. F. O'Malley, as described by him in the *Tribune*, is as follows:

Nothing more than the practical application of a prank bad boys used to be guilty of at school. A very small amount of sulphur judiciously applied to the furnace in the cellar had the effect on several occasions that came under my personal observation of forcing the teacher to declare a holiday. With the modern ventilating systems now installed in most of our schools, which changes the air in every room in the building every eight minutes, the matter of fumigation is made very simple. By burning sulphur in the draft of the fan which maintains the positive circulation every nook and corner of the building must necessarily be permeated by the fumes. Any lurking odor of the sulphur can be killed by the application of any of a dozen disinfectants or deodorizers applied just as was the sulphur.

A FIRE doing damage to the extent of several thousand dollars visited the plumbing establishment of T. V. Shadick's Sons, 253 Central avenue, Albany, N. Y., on January 10. The loss is covered by insurance.

THE I. X. L. PUMP COMPANY, 1015 Christian street, Philadelphia, have distributed among their friends a unique and attractive calendar for 1900 representing a slanting roof house of the usual Japanese architecture, with two rows of lanterns hanging from the cornice, while a view of a Japanese flower garden shows through from the background.

Heating and Plumbing Notes.

PECK BROS. & CO., New Haven, Conn., are doing an increasing business with their fine show of Plumbing Goods at 27 West Forty-second street, New York, and at Oliver and High streets, Boston, Mass. They are also reaching out for foreign trade, having sent a representative abroad to seek further market for their goods.

FIELD & BRAY, Hartford, Conn., heating and ventilating contractors, have lately installed two new Heaters for Francis J. Goodwin, four for W. J. Relyea and one for Herbert Saunders, using the Superior Furnaces, manufactured by the Superior Foundry Company of Little Falls, N. Y., for whom they are agents.

PUBLIC interest in ventilation is sometimes aroused by items in the daily papers like the following, from the New York *Tribune*: "As women grow older they are apt to live too much indoors," says John Hartley. "I believe the fat, flabby woman, whether purple or pale, with feeble, irritable heart, is usually the victim of rebreathed air. It must, I think, sooner or later be recognized that many of the increasing ills which it has been the fashion to charge on the 'hurry and brain fag' incidental to the high state of civilization and the large population are in reality due to the greater contamination of the air we breathe by the waste products of that population, and that toxins excreted by the lungs will in time take high rank among these as both potent and insidious. If this should come to pass the present ideas about ventilation must be abandoned as utterly futile, and the need will be felt, not of letting a little air in, but of letting waste products out."

THE council of Luray, Va., has granted a franchise to F. E. Stover of Luray for an acetylene gas plant for the town for $50 per year. The town will probably be lighted with this form of illuminant.

WM. T. HOLLAND, who was president of the Royal Arcanum Hospital Bed Fund of Kings County, died on January 14 at his home, 326 State street, Brooklyn, N. Y., from apoplexy. He was at one time a manufacturer of Heating and Ventilating Apparatus, but subsequently went into the life insurance business and was prominent in the Royal Arcanum. He leaves a widow, one son and two daughters.

GREENSBURG, PA., is to have a steam heating system run through some of its principal streets. Those interested in the new enterprise are E. H. Bair, W. S. Lane, F. C. Gay, D. C. Ogden, Daniel Monahan, Morris Painter and other citizens.

E. TABOR, East Park, N. Y., has his blacksmith shop fitted up with steam pipes to keep his customers warm while getting their work done. This is an evidence of progress over the forge or the old stove that is usually depended on to warm the shop sufficient for the smith, whose exertions reduce his needs in this particular.

THE AMERICAN FOUNDRY & PIPE COMPANY of Pittsburgh, Pa., were incorporated January 15 with a nominal capital of $1000 by A. R. Price, W. G. Price, J. R. Scott

and J. Cowley of Pittsburgh and W. B. Scaife of Allegheny, Pa. As reported in our last issue the company propose to manufacture Soil and Plumbers' Pipe on a large scale at Jeannette, Pa.

THE NEW ENGLAND PLUMBING SUPPLY COMPANY of Springfield, Mass., says the *News* of that city, will sell their goods hereafter directly to the consumer until further notice.

MAYOR WHITE of Rome, N. Y., has appointed Prof. E. B. Nelson, A. J. Broughton and Health Officer Sutton to assist the Sanitary Committee of the Board of Health in formulating rules to govern plumbing work.

JOSEPH N. SPICER has moved his plumbing shop in the Banks Building on Water street, Southport, Conn.

TOM REID, who for more than 15 years has been employed in the Union Pacific shops at Rawlins, Wyo., has taken charge of the tin shop and general plumbing business of the J. A. Bennett Hardware Company.

A DECISION was recently rendered in the Ontario Divisional Court, Toronto, that will interest heating contractors, as it concerned a guarantee for a Heating Apparatus. The suit was for $141, the balance of the price for a Heating Apparatus in the defendant's house, under a contract which required that the furnace should heat the house to 70 degrees when the temperature outside was 10 degrees below zero. The defense was that it was not sufficient that the thermometer should once have registered 70 degrees when it was 10 degrees below zero outside, but that it should be shown that the Furnace was reasonably fit to heat the house. The construction put upon the contract by the court was that if the Furnace was fed and managed as such Heating Apparatus is ordinarily fed and managed it should give 70 degrees of heat when it was 10 degrees below zero outside. This being so, the court was of the opinion that it was clearly beyond doubt that the apparatus did not answer the guarantee and the decision was given in favor of the defendant, with costs.

A. WEISKITTEL & SON, Baltimore, Md., have contracted for a new foundry building at Highlandtown. The building will be 120 x 350 feet and equipped for the manufacture of Enameled Bathtubs and other Sanitary Enameled Ware.

THE DAY-WARD COMPANY, Warren, Ohio, manufacturers of Bathtubs and Instantaneous Hot Water Heaters, are building a large addition to their works, which will greatly increase their capacity.

HENRY C. ADAMS is making his headquarters at 105 Beekman street, New York, and visiting the trade in the interest of the Judson A. Goodrich Company for Steam Specialties and is also handling a line of Mill Supplies.

THE LEHIGH VALLEY EMERY WHEEL COMPANY, Weissport, Pa., in addition to making Grinding and Polishing Wheels for Iron Work make a specialty of Wheels for Brass Work. The Wheels for Brass Work have, we understand, been used by the Baldwin Locomotive Works for the past 15 years.

IT is understood that the new plumbing rules and regulations of the New York Building Department will first be published in the *City Record* next Monday January 22, and continued for eight successive weeks, and will then become operative.

A MERCURY THERMOMETER mounted on celluloid with gilded edges has been received with the compliments of the Vance Boiler Works, Geneva, N. Y., the manufacturers of the Vance Patent Steam and Hot Water Heaters. It is suggestive of the comfort derived from a good Heating Apparatus at this season.

A BILL has been introduced in the New York Legislature by Mr. Rodenbeck providing that a certificate of competency by an examining board of plumbers in any city in New York State shall entitle the plumber to registration and the right and privilege to engage in the business of an employing master plumber in any city of the State.

AT a meeting of the County School Directors of Pennsylvania at Millersville, Pa., E. K. Hershey gave a description of an experiment in heating and ventilating, in which he pointed out that he found it was better to introduce fresh warm air near the ceiling and to provide for its free entrance by removing the air in the room through openings near the floor.

New Firms and Changes.

ROUNDS & DENNISON CORPORATION, Boston, Mass., have been incorporated for the manufacture and sale of Plumbers' Materials, &c., with a capital of $5000, by H. E. Dennison, F. H. Rounds and H. Mayo.

THE EXHIBIT & TRADING COMPANY, Chicago, have been incorporated with a capital of $30,000 to manufacture Plumbers' and Steam Fitters' Supplies by Clayton R. Taylor, William J. Pell and F. E. Dauman.

PAPERS of incorporation have been issued to the Reliance Gauge Column Company of Cleveland, with a capital stock of $50,000, to manufacture Water Columns for boilers, steam traps, water gauges and gauge cocks. The incorporators are Harrison L. Chandler, Robert J. Franckleton, Charles L. Douglas, Norman A. Gilbert and Adire T. Hills.

CHARLES GEISER has opened a plumbing shop at 107 West Second street, Pueblo, Col.

THE ALABAMA SUPPLY COMPANY, with a capital of $25,000, have been incorporated to manufacture and deal in Gas, Electrical and Plumbing Supplies and Fixtures. The following officers have been elected: President, Gus Colvin; vice-president, C. H. Colvin; secretary and treasurer, C. C. Jinks.

S. W. & M. H. STACK have opened a plumbing establishment at 53 Holland street, West Somerville, Mass., under the firm name of S. W. Stack & Son.

THE copartnership between Joseph Sprouls and George Gerraghty in the plumbing business in Jersey City, N. J., has been dissolved.

HARMSEN & BELCHER of Atlanta, Ga., have opened a plumbing shop at Anniston, Ala., under the charge of John S. Belcher.

Notice was issued from Pittsburgh last week to the effect that the business heretofore conducted under the firm name of the Star Dinner Pail Company, Limited, had been incorporated and would hereafter be conducted under the style and name of the Star Enameling & Stamping Company. The change was made on account of the concern's largely increased line of manufactures, which now include all standard sizes of dinner pails of regular grade, heavy polished and japanned; also a full line of bread boxes, flour cans, sugar boxes, spice boxes and other japanned goods, likewise wash boilers, pressed wash boiler covers, hemmed and rimmed pot covers, sap pails, dairy pails, strainer pails, sprinklers, garbage cans, &c.

A plan is on foot for the establishment in the near future of a permanent exposition of American manufactures in Constantinople, to serve as a center for the extension of the trade in American products in Turkey, Greece, the Levant, Egypt, the Balkan States and Southern Russia.

C. R. McCarey, who for five or six years has been identified with the house of John H. Graham & Co., New York, is going to Cuba January 20 to assume charge of the Hardware department of the Gomez-O'Brien Company, located at O'Reilly 17, Havana, whose New York office is at 234 Broadway. For this department the house export Plumbers' Supplies, Sugar Plantation Machinery, Refrigerators and Ice Making Plants, &c.

The New York Rapid Transit Tunnel.

After long and exasperating delays, rapid transit for the citizens of New York is at length in sight. The contract for a tunnel railway, to extend from the City Hall to Harlem, was awarded this week to John B. McDonald on his bid to build and equip such railway for $35,000,000. The work is to be begun within 30 days, and is expected to be completed in three years. The railway will start at a point in Park Row near Frankfort street, with a two-track loop under the City Hall Park, Broadway and Park Row, from whence will begin a four-track line, running thence under Centre street, New Elm street and Lafayette place to Fourth Avenue, thence under Fourth avenue and Park avenue to Broadway, and under Broadway and the Boulevard to a point near Ninety-seventh street. At this point the railway will divide into two sections, the east and west side lines. The east side line will branch off at 103d street, crossing below Central Park to Lenox avenue, continuing under the Harlem River to Westchester avenue, where, at a convenient point, the tracks will emerge from the tunnel and be carried on a viaduct along and over Westchester avenue, Southern Boulevard and the Boston Post Road to Bronx Park. The west side line will continue under the Boulevard to a point near 123d street, where it will emerge from the tunnel and be carried on a viaduct along and over the Boulevard to a point between 134th and 135th streets, where it will again pass into a tunnel under and along the Boulevard to 190th street. Here it will again emerge from the tunnel and be carried on a viaduct to Kingsbridge, over the Harlem Ship Canal and Spuyten Duyvil Creek, and through Riverdale avenue to a terminus near Bailey avenue. The construction of this work will call for about 11,660 tons of steel beams, 11,860 tons of riveted steel, 7920 tons of cast iron columns, 11,500 feet of iron pipe, 304,800 feet of steel rails, and 23,500 tons of steel viaduct; in all, about $10,000,000 worth of iron work.

An interesting piece of photographic work has just been accomplished in connection with the Saint Clair tunnel of the Grand Trunk Railway in the preparation of a moving picture of the interior from a train moving at the rate of 30 miles an hour. The work was done by officials of the Grand Trunk, with the aid of specially prepared apparatus. The Toronto *Globe* describes the arrangement: "The car on which the working machines were placed was fitted up with a specially arranged outfit. A small house was built on the right in front of the car (the car being what is known as a gondola or flat car with sides) in which were arranged the four powerful flashlight machines. The machines were connected with the compressed air on the locomotive with proper attachments on the tubing to regulate the air which forced the magnesium powder from the powder chambers of the flashlight apparatus out through an aperture across a flame of alcohol, where it ignited and gave forth a great light of pure white and brilliancy, and with parbolic reflectors placed behind the flame the light was thrown for a distance of more than a thousand feet, illuminating the tunnel to the smallest detail and producing the desired effect for a sharp and good negative. Though not attended with danger, the experiments were certainly most novel and exciting, as can be imagined. The engine, running like a huge bullet through what practically looked like an immense gun barrel, illuminated with a light that could not be faced, and necessitating the operators and those who took part in the experiments to wear blue glasses, and rushing through this hollow tube at a 30-mile pace." The pictures are intended for the Paris Exposition.

The German Emperor has created a new academical degree, that of "doctor of engineering." The first recipient of the new degree from the Charlottenburg Polytechnic will be Prince Henry of Prussia.

Wireless Telegraphy on Mont Blanc.

During the autumn, Jean and Louis Lecarne conducted wireless telegraphy experiments on Mont Blanc, which would be highly interesting even if their researches were not the first of this kind carried on at high altitudes. The results have been communicated to the French Academy. M. Vallot placed the stations of his observatory at the experimenters' disposal, and his wife and daughter assisted in the operations. The sending station was down at Chamonix, about 3450 feet above sea level; the receiving station at an altitude of about 14,350 feet, nearly 11,000 feet further up; the distance between the two stations is 7.5 miles, as the crow flies. The transmitter consisted of a high tension transformer, constructed by Seguy, fed by a continuous current dynamo of 50 volts pressure. The circuit contained a Neef interrupter, and gave, in the primary, sparks 7 inches in length. This spark length was reduced to 0.8 inch when the transformer terminals were connected, the one with the earth, the other with the mast, so-called —a 0.1-inch copper wire, 80 feet long, stretched obliquely. The receiver consisted of a dry pile, a relay, an electric bell, a tapping device and a coherer tube, containing gold filings, lent by Branly. Fitted up without earth or "mast" connection the apparatus responded to sparks of 1 mm. at a distance of 330 m. The whole apparatus was placed within a hut covered with sheet copper. The earth wire was joined to the lightning conductors; the air wire "mast" was formed by an iron wire, stretched parallel to the "mast" below, and connected with the hut by 164 feet of copper wire. The two stations are in sight of one another, and optical signals were exchanged during the course of the experiments. The experiments were made generally every morning about 11 o'clock, on the days of August 15 to 25. The oscillator balls had to be put 2 cm. apart to give distinct signals. Clouds between the two stations did not disturb the performance; atmospheric electricity did not much interfere with the working, although it set the apparatus going several times. The earth wires could not be taken down to liquid water, as the soil consists of mica schist covered by ice; yet the apparatus worked satisfactorily. This was one of the special points which J. and L. Lecarne wished to investigate, and on which further particulars will be welcome. For it will be remembered that at present authorities differ as to the necessity of earth connection. Observations during storms and gales could not be made, as the weather was always fine. The most noteworthy observation is that no signals could be exchanged when the electric lamps were alight down at Chamonix, where triphase currents of 2500 volts are employed. Details about the nature of the interference caused by the illumination are not offered. The experimenters content themselves with the suggestion that other than the Marconi arrangements should be applicable for wireless telegraphy. That suggestion is, of course, not novel. A year ago, Zickler observed that the invisible ultra violet rays of arc lamps can be used for telegraphing by aid of a screen of common glass which absorbs these rays, interposed in their path, in lieu of the make and break arrangement of ordinary telegraphy. Using Schuckert searchlights and continuous currents, Zickler was able to send signals nearly a mile away, and further progress may have been made. In the Lecarne case, however, we have to deal with the influence of continuous radiation on disruptive discharge effects.

The Director of the United States Mint announces that the total coinage during 1899 was $139,243,191, of which $111,344,220 was in gold, $26,061,519 in silver, and $1,837,451 in nickels and copper.

The International Association of Machinists are preparing for a general movement for a nine-hour working day to commence April 1.

PATTERN FOR TAPERING PANEL.

A Brooklyn correspondent wishes to learn through *The Metal Worker* how to cut the pattern for a tapering panel, a sketch of which is shown in Fig. 1. Let A B C D be the plan of the panel and E F G a section on the line B D, the elevation being shown by H I J. The central lines in elevation, plan and section are indicated by the dotted line K M L. As each quarter plan is uniform it will only be necessary to obtain the pattern for one quarter. The pattern will be developed by triangulation; therefore divide the quarter plan D C into equal spaces, as shown by the small figures 1 to 9, and draw lines as shown to the center of the plan M. These lines will represent the bases of the triangles, whose altitudes are equal to K I in elevation or F L in section. Now measure each and every line in plan from M 1 to M 9 and place the lengths as shown in section from L 1 to L 9, measuring in each and every instance from the point L. From the small figures 1 to 9 draw lines to the apex F. Then will these lines,

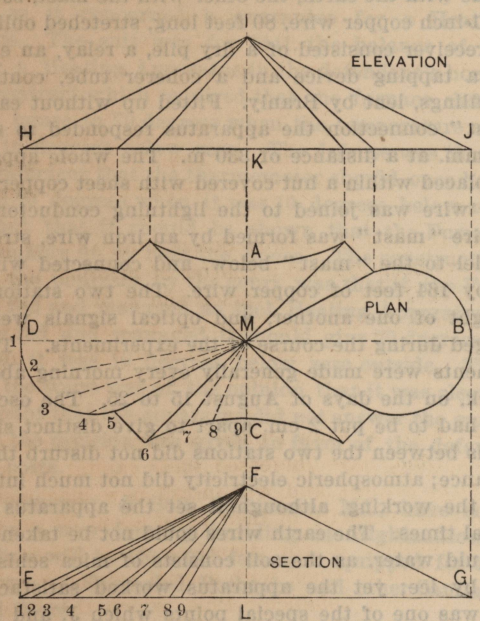


Fig. 1.—Plan, Elevation and Diagram of Sections.

F 1 to F 9, represent the true distances on the finished article on lines of similar numbers in plan.

For the pattern proceed as follows: With any point, as A in Fig. 2, as center and with radii equal to F 1 to F 9 in section in Fig. 1 describe arcs as shown in Fig. 2 by 1, 2, 3, 4, 5, 6, 7, 8 and 9. From any point on the arc 9 draw the line 9 A. Now set the dividers equal to the divisions in 9 6 in plan, Fig. 1, and setting one leg of the compasses in the point 9 of Fig. 2 step from one arc to the other of corresponding numbers until the point 6′ on the arc 6 has been obtained. Now take the distance 6 5 in plan, Fig. 1, and step from 6′ of Fig. 2 to the arc 5, as shown by 5′. Now set the dividers equal to the divisions in 5 1 in plan, Fig. 1, and starting from the point 5′ on the arc 5 of Fig. 2 step from one arc to another having corresponding numbers until the point 1′ on the arc 1 is obtained. Draw a line from 1′ to A and trace a line through intersections on the various arcs, as shown from 1′ to 5′ to 6′ to 9. Then will A 9 1′ be one quarter of the pattern. If the pattern is desired in one piece trace the quarter pattern opposite the lines A 1′ and A 9, as shown. Then will 9′ 1′ 9 1″ 9″ be the full pattern.

J. K. Smith, the well-known roofing contractor of Waterbury, Conn., is now putting on the slate roof of W. K. Vanderbilt's new mansion at Oakdale, L. I. His contract also includes the metal work, which he has sublet to the G. Drouve Company of Bridgeport.

The Globe Ventilator.

We are indebted to the Globe Ventilator Company of Troy, N. Y., for a copy of a very interesting pamphlet bound in light green covers, setting forth the merits of the Globe ventilator. The importance of ventilation in buildings is pointed out, and it is shown how this may be accomplished by the aid of the device mentioned. The Globe has been before the public for many years, and is favorably known to architects, builders and the trade generally. Numerous testimonials are presented showing the satisfaction which the device has given, while many of the illustrations are of buildings in connection with which the Globe ventilator is used. The pamphlet also calls attention to Globe ventilated ridging in brass, copper and galvanized iron, and to the fact that the Globe ventilator is especially adapted for ventilating schools, churches, hospitals, theaters, factories, armories, cars, steamships, stables, and, in fact, buildings of all descriptions. Many of the illustrations are half-tone engravings, which add materially to the artistic effect of the catalogue. The last page is devoted to a price-list of the Globe ventilators.

The Berger Mfg. Company.

A very enjoyable evening was spent by the officers and employees of the Berger Mfg. Company, Canton,

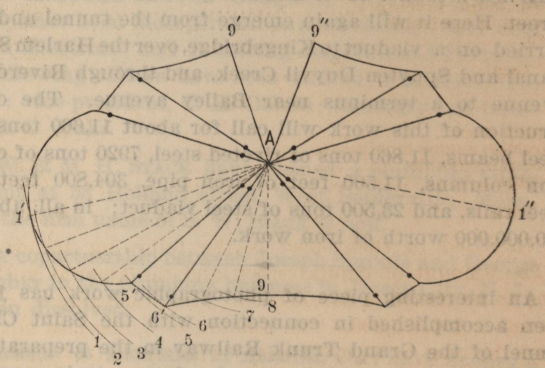


Fig. 2.—The Pattern Shape.

PATTERN FOR TAPERING PANEL.

Ohio, at a banquet tendered the officers and office employees by the salesmen of the concern. The dinner was given at the Barnett House, Canton, Thursday evening, January 11. A large party sat down at the tables in the spacious dining room, which was handsomely decorated for the occasion. The dinner began a little after 9 o'clock, and was an elaborate and enjoyable affair. The toastmaster was S. Y. Buckman, well known to the sheet metal and roofing trade, and the toasts and the responses were as follows:

Growth and Success of the Berger Manufacturing Company.....Hon. John E. Monnot
Our Salesmen.....Ed. Langenbach
Salesmen's Expense Account.....Hon. Jos. Biechele
Punctuality and System.....R. H. Yancey
Vocal Selection.....Charles Lang
Our Troubles on the Road.....Walter Voigt
Greeting to the Ladies of Our Office.....Geo. Barnes
Commercial Courtesy.....F. Schwertner
Grand Chorus.....The Berger Indians
Music.....F. Derlich's Orchestra

A new Sheet mill plant will be erected, it is reported, at Middletown, Ohio. Ten acres of land and a cash bonus have been granted by local interests, and the promoters of the enterprise guarantee an output of 30 tons of Black Sheets and 15 tons of Galvanized Sheets daily.

AMERICAN TIN PLATE COMPANY'S ANNUAL MEETING.

The first annual meeting of the American Tin Plate Company was held at Orange, N. J., on Tuesday, January 16, when officers and directors were elected, as follows:

President, D. G. Reid.
First Vice-President, William B. Leeds.
Second Vice-President, William T. Graham.
Third Vice-President, Warner Arms.
Treasurer, F. S. Wheeler.
Secretary and Treasurer, E. G. Applegate.
Assistant Secretary, W. B. Wheeler.
Counsel, James B. Dill.

Directors: To serve one year more, George Greer, William H. Donner and Cecil A. Robinson; to serve two years more, Warner Arms, James B. Dill and Frederick S. Wheeler; to serve three years more, William T. Graham, James McLean and James H. Moore; to serve four years more, Daniel G. Reid, William B. Leeds and William H. Moore; to serve five years more, William E. Reis, Richard R. Quay and James A. Mathews.

About $35,000,000, out of $46,000,000, of the capital stock issued was represented at the meeting. The following statement of the assets and liabilities of the company on December 31, 1899, was presented:

Assets.

Plants, real estate, machinery, &c	$43,404,508.04
Merchandise, inventory	4,951,925.40
Accounts receivable	1,516,247.35
Cash	989,984.34
Total	$50,864,665.13

Liabilities.

Capital stock	$46,325,000.00
Purchase money mortgages	270,000.00
Accounts payable	1,656,236.98
Surplus	2,613,426.15
Total	$50,864,665.13

Included in the report is the following statement: "The amount of capital stock and the amount authorized to be issued is $50,000,000. The proportion actually issued is $46,325,000. The amount of debts does not exceed the sum of $1,926,238.99. The amount of assets is at least the sum of $7,460,157.09."

The reported surplus of $2,613,426 is taken to indicate that the company's net earnings last year were less than had been expected early in the year. The company, however, are known to have started with a large number of contracts at low prices, some of which involved deliveries extending throughout nearly the entire year. No action was taken in regard to a dividend on the common stock. It is understood that the management of the company desire to place the business on a strong financial footing and to retain sufficient funds in hand to carry out extensive changes that are contemplated in their plants in the direction of concentrating the manufacturing facilities.

The Ætna-Standard Iron & Steel Company.

On January 1, 1900, the National Steel Company secured control of the blast furnaces, Steel works and rolling mills of the Ætna-Standard Iron & Steel Company at Mingo Junction and Bridgeport, Ohio, and will hereafter operate them as the Ætna-Standard works. The Ætna-Standard Iron & Steel Company continue their corporate existence with John A. Topping, president, and Isaac M. Scott, secretary and treasurer, and will carry out all contracts or other obligations that they may have outstanding. The financial operations and accounting will be directed by the general offices of the National Steel Company, and all remittances or settlements of accounts should be made through National Steel Company, Marquette Building, Chicago.

In this connection we note also the fact that B. M. Caldwell, formerly vice-president and general manager of the Ætna-Standard Iron & Steel Company, has severed his connection with that concern, at his own request, in order to devote more time to his personal affairs. He will not, for the time being, engage actively in any other business, but will be absent for a number of months on a Southern cruise.

The position of vice-president and general manager has been abandoned, John A. Topping, manager of Ætna-Standard Works, National Steel Company, assuming the general management of both the operating and commercial departments. The retirement of Mr. Caldwell from this concern was sincerely regretted by his associates, who endeavored to persuade him to continue with the concern, but without avail. Mr. Caldwell retires with the very kindest feeling existing between himself and his former associates.

FLASHINGS.

WILLIAM T. DISLEY, Waterbury, Conn., has the contract for the roofing and galvanized iron work in connection with the new block of stores which the Tracy Bros. Company are building in Torrington for George L. Lilley.

THE CHATANOOGA STEEL ROOFING COMPANY, Chatanooga, Tenn., of which J. E. Annis is the president, are about to erect a new factory equipped with modern machinery.

THE BANGOR EXCELSIOR SLATE COMPANY of Easton, Pa., have been granted a charter of incorporation. R. S. Brown, H. J. Steele, B. Pearson and E. R. Armstrong of Easton, and C. Miller of Nazareth, Pa., are the directors. The company have a capital stock of $250,000, and will manufacture and sell Roofing Slates and other Slate goods.

THE WAIS & ROOS PUNCH & SHEAR COMPANY, Cincinnati, Ohio, have increased their capital stock from $50,000 to $75,000, and will install new machinery, increasing the capacity of their plant about 50 per cent.

THE business of the American Steel Roofing Company, Cincinnati, Ohio, with special emphasis upon the Patent Polygon Conductor Pipe, which they manufacture, is brought to the attention of the trade by a handsome colored calendar, reproducing a pretty picture of the Bride and the Fortune Teller. The calendar consists of monthly sheets showing the days of the week and month, as well as the phases of the moon.

THE ANNOUNCEMENT is made to the trade by Benjamin Obdyke, that on and after January 18 the main office for the transaction of his business as manufacturer of Corrugated Conductor Pipes, Fittings, Hanging Gutters, &c., will be at Room 509, the Real Estate Trust Company Building, southeast corner Broad and Chestnut streets, Philadelphia, Pa.

The Goulds Mfg. Company, Seneca Falls, N. Y., recently shipped three carloads of pumps to Siberia, by way of Seattle, Wash.

The Simmons Hardware Company, St. Louis, Mo., who were the first concern in the West to inaugurate the profit sharing system, made for 1899 the largest division of profits among their employees in the history of the house. The company are among the largest jobbing houses in the world.

The New York State Canal Commission appointed by Governor Roosevelt have recommended two plans for the creation of a ship canal across the State between the Lakes and the Atlantic Ocean. One is to widen and deepen the existing canals and enlarge and improve the locks at an estimated cost of $20,000,000. The other plan, which is the one most strongly favored by the Commission, is to widen and deepen the present canals and enlarge and improve the locks and dig about 81 miles of new canal between Syracuse and West Troy and carry the waterway around the cities of Rochester and Syracuse, at a cost of about $60,000,000.

SCRAP.

SIR F. A. SWETTENHAM, the British Resident-General of the Federated Malay States, in a recent report to his Government declares that there are no signs of exhaustion in the Tin producing districts of the Malay Peninsula. In many parts, he says, the Tin deposits have been scarcely touched, and there are vast tracts yet to be developed.

CHARLES H. MILLER, formerly at the Star Tin Plate plant, Pittsburgh, Pa., has been appointed superintendent of the finishing department of the United States works of the American Tin Plate Company at Demmler, Pa.

RUMORS have been prevalent lately of a big combination in the Tin Can manufacturing industry under the auspices of ex-Judge Moore, of Chicago. No verification of the report, however, is obtainable from responsible sources, and by many in the trade the success of any enterprise of the kind is held to be more than doubtful. Efforts to combine the Tin Can manufacturers have been made from time to time without result. The nearest approach to anything of the sort in the trade is an agreement as to prices, &c., which exists between certain of the larger Baltimore Can making concerns, namely, the Norton Tin Plate & Can Company, R. Tyne Smith & Co., the A. Booth Packing Company, and Black & Krebs, who are known as the "Big Four." The agreement is local, however, and confined to the above-named concerns. It is claimed in some quarters that the only practicable method of organizing a consolidation of the Tin Can industry is by making it an adjunct of the American Tin Plate Company, who control the raw material.

MCCLURE & Co., 211, 213 and 215 Second avenue, Pittsburgh, Pa., and 115 North Seventh street, Philadelphia, Pa., direct attention to the fact that they are exclusive selling agents for the Tyler Charcoal Iron Tin Mills, Washington, Pa. We are advised that a part of the product of this concern will be "McClure's Redipped Roofing Tin," made from genuine charcoal iron. McClure & Co. ask the trade to send them inquiries relating to the product of this new plant.

Solders for Glass.

It has been recently discovered, says an exchange, that an alloy composed of 95 parts of tin and 5 parts of zinc will melt at about 392 degrees F. Becoming firmly adhered to the glass, it is unalterable, and exhibits an attractive luster. An alloy containing 90 parts of tin and 10 parts of aluminum will melt at 500 degrees F., and also forms a strong and brilliant solder for glass. With these two alloys always ready to hand glass may be soldered as easily as two pieces of metal. When the glass is heated in a furnace the soldering can be accomplished by rubbing the surface with a rod of either of the compositions named. The alloy as it flows can be evenly distributed with a soldering iron.

A New Anti-Freezing Liquid.

In many manufactures it is a necessity to work with a liquid which does not freeze. Up to the present time it was usual to lower the freezing point of water by an admixture of salt or glycerine. According to a report made to his Government by the British Consul-General at Berlin, Germany, a liquid has been found which is much more effective in resisting the action of cold than anything of the kind yet discovered. It is called "Calcidum," and is thus described: By mixing this Calcidum with water one can lower the freezing point to any desired depth. In the manufacture of acetylene gas this discovery is of immense importance. The police regulations existing in Berlin forbid the generation of acetylene gas in houses or in massive buildings. It is only then in lightly built sheds in which water easily freezes that this manufacture is permitted. By the use of Calcidum the manufacture can be carried on in the open air with only a light roof to protect it from snow. In many other industries similar advantages can be obtained by its use, and among experts much is hoped as to the progress in manufactures to be made by the new discovery. Calcidum is a colorless liquid, heavier than water, hydroscopic, non-inflammable (rendering stuff so impregnated also non-inflammable), and does not eat into metal. The Patent Bureau of Richard Lüders, in Görlitz, send small samples gratis on application.

TRADE NOTES.

THE SPECIALTY MFG. COMPANY, of Moundsville, W. Va., manufacturers of Steel Measures, are removing their plant to Wheeling, W. Va.

A COMPANY have been formed at Ann Arbor, Mich., with a capital of $16,000, for the manufacture of Gasoline Lamps. H. W. Clark, D. E. Seeley, H. H. Seeley and A. W. Straight of Ann Arbor, and R. H. Pinckney and Burton D. Ames of Detroit, are interested.

THE GLOSS STOVE BLACKING COMPANY of Saratoga Springs, N. Y., have been incorporated with a capital stock of $3000 by F. M. Cozzens, W. C. Van Dorn, and J. B. Beagle, to manufacture Stove Polish.

MATHER BROTHERS COMPANY of Richmond, Ind., have been incorporated, with a capital stock of $15,000, to manufacture Sewer Pipe, &c., the incorporators being J. A. Goddard, B. Starr, S. W. Garr and H. L. Mather, all of Richmond.

IMBODEN MANTEL COMPANY, Chicago, have been incorporated for the purpose of manufacturing Gas Burning Apparatus, with a capital of $5000, by I. H. Lee, D. W. Lee, F. J. Martin, all of Chicago.

THE WILSON ALUMINUM COMPANY of Holcomb's Rock, W. Va., are building a plant at Great Kanawha Falls, near Charleston, to develop 7500 horse-power.

UNITED STATES CONSUL WORMAN, at Munich, Bavaria, says American Brass Lamps have a good field in that district and would quickly find favor.

THE NATIONAL ENAMELING & STAMPING COMPANY'S new plant at Granite City, Ill., is making rapid progress toward completion. The work will include a main hot mill building, 700 x 120 feet, containing sixteen 36-inch squaring shears, four 54-inch squaring shears, four roll lathes and two 20-ton Morgan traveling cranes, the latter driven by electricity. The annealing department, 577 x 71 feet, will contain the cold rolls, ten double annealing furnaces, equipped with Freeman's charging machines, two 20-ton electric cranes and four latest improved Mesta pickling machines.

THE GURNEY REFRIGERATOR COMPANY, Fond du Lac, Wis., shipped a carload of Refrigerators on the 11th inst., destined for Honolulu.

THE WESTERN ROOFING & ASBESTOS COMPANY are to be incorporated at Chicago, with a capital of $50,000, for the purpose of manufacturing Roofing and Boiler and Pipe Coverings, by F. H. George, E. S. Main and H. B. Rowell.

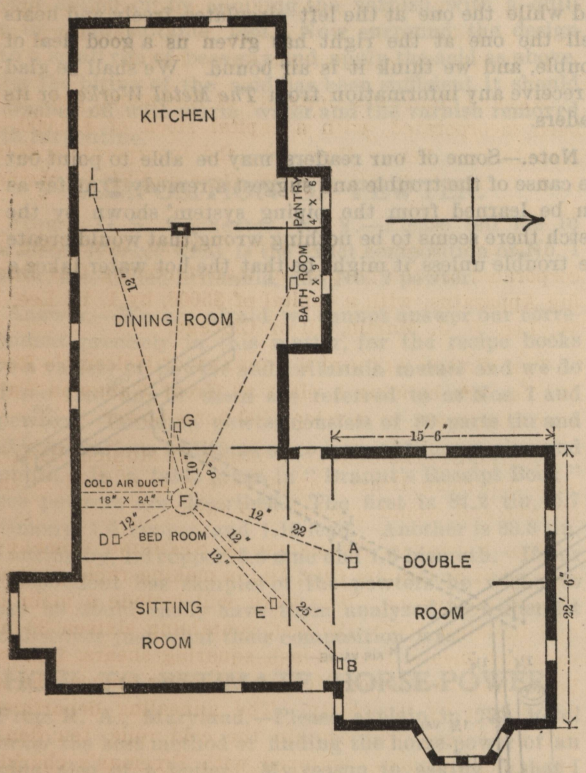
GEO. E. DAY, 735 Marquette Building, Chicago, has been appointed Chicago manager for the Newport Sand Bank Company of Newport, Ky., producers of Molding Sand for general foundry use.

ARTHUR T. RUTTER, for many years identified with the late William S. Fearing, 256 Broadway, New York, has succeeded to the business, which he is carrying on at the same address. Mr. Rutter's line includes Sheet Brass, German Silver, Copper, Brass and German Silver Wire, Brass and Copper Tubes (small Tubing a specialty), Brass and Copper Rods, Brass Ferrules, Sheet and Ingot Copper, Spelter, Tin, Antimony, Lead, &c.

THE LETTER BOX.

COLD AIR FROM WRONG SIDE.

From S. V. M., Salem, Ill.—I shall be glad to receive some assistance in overcoming a trouble with a warm air furnace which we put in a short time ago. I submit herewith the plan of the house, showing the location of the furnaces, registers, doors and windows. An 8-inch smoke pipe connects the furnace with an 8 x 12 chimney, as shown at C, and air is supplied by an 18 x 24 cold air duct opening to the south. There are 12-inch pipes leading to the registers marked A, B, D, E and I; a 10-inch pipe to the register G and an 8-inch pipe to the register J in the bathroom. What we would like to know is, why is it that the registers A and B in the double north room do not furnish warm air? These pipes are 12 inches in diameter and 22 and 25 feet long respectively. All the pipes are thoroughly wrapped with asbestos paper, and



Cold Air from Wrong Side.

the furnace, which is a No. 24 of the standard make, has a rated capacity of from 20,000 to 30,000 cubic feet, has a good draft and all of the registers furnish plenty of warm air except A and B. When the registers E and D in the sitting room and bathroom register are closed these pipes furnish some warm air. The rooms are about 11 feet high and there are about 18,000 cubic feet of space in the whole house. There is a cellar under the entire house. Any information to help us will be greatly appreciated.

Note.—Doubtless our furnace readers will have something to contribute for the assistance of this correspondent. It seems to us that the cold air supply is taken from the wrong side of the house, and with its present location it has too small a capacity, the combined area of the hot air pipes being 693 inches and the area of the cold air duct but 432. When the cold air supply is taken from the south side it should have the same area as the hot air pipes. It is possible that, taken from the opposite side, where it will get the benefit of the prevailing winds, the increased pressure would make up for the lack in capacity. Pipes 22 and 25 feet long running toward the north seldom give good results unless they have a pitch that is greater than can ordinarily be provided. A pitch of 1 inch to the foot is thought necessary for pipes 15 feet long, and longer pipes should have a greater pitch, which is difficult to obtain. From the great distance apart that the registers seem to be located, as far as we can judge without the dimensions of the building, we should say that this is a building in which two small furnaces would give better service than one large one. If the location of the present furnace is changed to favor the two troublesome pipes it is quite possible that trouble will be developed in the pipe I. If, however, the heating of the room which contains the registers A and B is more important the furnace can be moved nearer to the hall, so as to shorten the pipes A and B without seriously affecting the heating from the other pipes, except I. It is probable that the trouble is not so much with the furnace as it is with its location and the location of the cold air supply. The back of the furnace ordinarily furnishes the larger and stronger currents of hot air and should be toward the rooms most difficult to heat, and we assume from the plan that the furnace is not so placed in this case. We think if the arrangement is changed with these suggestions in view it will render more satisfactory service.

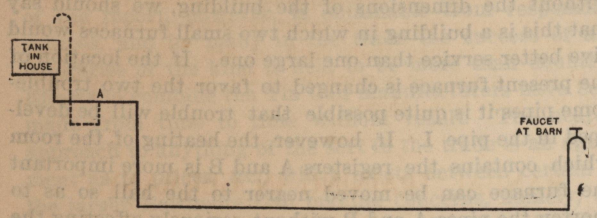
FURNACE HEATING.

From C. S., Iowa.—I read the editorial in *The Metal Worker* some time since that a series of articles was going to be presented on furnace heating, and having had a long experience in this branch of the trade concluded that it would be of no interest to me, for having solved the problems so that I make only here and there a failure nowadays, I made up my mind that this would be a part of the paper that I would not care to read. I concluded that many other men would be in the same position as I thought myself to be. However, I have read these articles as they have appeared very carefully and also critically. At one time I was of the opinion that the trade at large could not be greatly benefited by these articles, and because I have changed my mind is the reason I explain the views which I once had, but which have now been considerably changed. I thought that no man would need to go to the trouble that would be necessary with Mr. Snow's method of finding out how to heat a building. I no sooner arrived at his conclusion than I thought that if a man was a first-class tinsmith and was sent to do furnace work how would he know anything about the sizes of the pipe and other proportions of the job unless some one had laid it out for him. Then I concluded that if a bright man had got this series of articles from the paper and could refer to them he would have something to start with. Then I called to mind a number of instances where the fathers who had built up a furnace trade had died and left their business to their sons, who had always depended on their fathers for laying out their furnace work. I knew that in many instances these youngsters lost a great deal of money before they gathered an experience of their own which enabled them to do furnace work satisfactorily. If a young man in such a position has Mr. Snow's articles he may spend a great deal of time in laboriously finding out what will be necessary in heating a building, but will not be all at sea when he gets done. I am glad that Mr. Snow so far has kept to the better class of work, and while it is true that men who have had a large experience would be probably able

to do a job for a great deal less money than a young man who is starting in and had no other qualifications for the work than being a good tinsmith and the information derived from Mr. Snow's articles, it is quite probable that his youth and ingenuity, backed with such sound information, would soon enable him to hold his own with an experienced contractor. I think Mr. Snow would have done well to have pointed out that the small pipes used in partitions are the cause of many furnaces failing to heat buildings with the large amount of coal consumed and to the fact that furnaces do not last as long as their owners think they ought to.

AIR BOUND WATER SUPPLY PIPE.

From T. R., Rome, N. Y.—Will you please inform me how I can remedy the trouble which I found in the water supply pipe shown herewith? There is a wind mill that



Air Bound Water Supply Pipe.

pumps water into a tank on the second floor of the house and the tank holds about one and one-half barrels. There is a pipe from the bottom of this tank that runs to two faucets in the house and then on to the barn. The trouble is now that when the water is drawn out of the tank and it is filled again the supply pipe gets air bound so that it will not run at the barn until the air is pumped out of the pipe. Will it work better if a trap is put close to the tank, as shown by the dotted lines, and the trap relieved by a pipe as indicated?

Answer.—Evidently there must be air traps in the pipe between the house and the barn in which air accumulates and hinders the flow of water at the barn faucet. The trouble can be removed by running this pipe so that a true pitch will be preserved throughout its entire length, which will allow the air that is naturally contained in water to escape without making an accumulation to stop the pipe. The proposed trap near the tank would be of no use and would increase rather than relieve the trouble, and the vent pipe as placed would be of no use. If the trap was used the air vent pipe should be connected at A.

CORRODED METALS.

From B. E. G., Delaware.—I inclose a piece of sheet lead and a piece of sheet brass, the former taken from a flush tank lining after nine months' use, the brass from a flush valve after one year's use. The tank was copper lined and this brass seems to be copper plated. Our water will eat a copper lined tank full of holes in about one year and lead lining about the same. The rows of holes were at high water mark in the tank and the bright side of the lead was next to the wood and was all covered with a white powder. What is the cause of this? Our pumping station and electric plant are in the same building. Has electricity anything to do with the trouble?

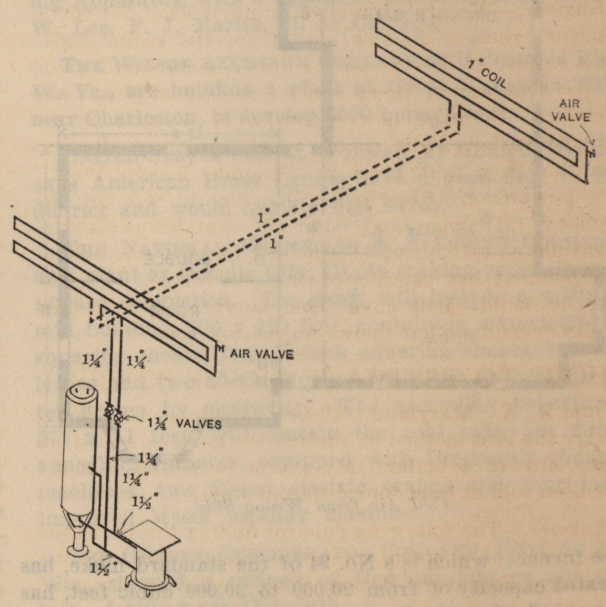
Answer.—The brass sample our correspondent refers to is covered with a reddish deposit that has a coppery look and the sample has evidently been corroded through along one edge. The lead has a line of pittings to which our correspondent refers, some of them extending through the sheet. Electric action by escaping currents from the electric pump may have had a helping effect in the absorption of the zinc in the brass by the water, and the thin deposit of the copper as an oxide, or rather the retention of the copper in the brass and its oxidation on the surface. By scraping the surface the interior appears to be brass and by burnishing the surface it appears to be metallic copper covered with a thin film of oxide of copper. This may have been caused principally by galvanic action between the copper lining of the tank and the zinc element in the brass flush valve.

The pitting of the lead lining is probably caused by excessively aerated water on the surface level of the tank. Any movement of the water up or down or by ripples will keep a small zone wet, when moisture and air will oxidize the lead and the water will absorb the oxide, and to a certain degree the whole surface of the lead tank will be acted on and absorbed by the water. The peculiar form of action by pitting is common with other metals, whether by electrolysis or the slow process of oxidation in presence of water or moisture. The white coating on the back of the lead is carbonate of lead, the carbonic acid being derived from the wood, and seems to have had some excessive action from certain streaks in the wood, shown by small lines of pit holes.

SHORT CIRCUIT HINDERS HEATING.

From N. & D., New York.—We submit herewith a sketch of a heating system in connection with a range boiler and water back which has given us some trouble. The heating coils are placed on the floor above the boiler, and while the one at the left circulates freely and heats well the one at the right has given us a good deal of trouble, and we think it is air bound. We shall be glad to receive any information from *The Metal Worker* or its readers.

Note.—Some of our readers may be able to point out the cause of the trouble and suggest a remedy. As far as can be learned from the piping system shown by the sketch there seems to be nothing wrong that would create the trouble unless it might be that the hot water takes a



Short Circuit Hinders Heating.

short circuit through the nearest coil and fails to pass through the other one. If the coil is air bound, as is suggested, it is a simple matter to go over the pipes and arrange them so that there will be a pitch all the way from the water heater to the highest point, where the air valve should be placed. By this means all air that might accumulate in the pipe can pass to this point and escape.

PATTERN FOR BOAT.

From A. R., San Jose, Cal.—Will some reader of *The Metal Worker* furnish a pattern for a metal boat? What I want is a scull boat suitable for two persons, which will be low in the water and have a sail and oars, also an adjustable centerboard or leeboard.

MARKING TOOLS.

From C. B. G., Bridgeton, N. J.—We wish to mark some tools and have been looking over *The Metal Worker* for some months back for a recipe that appeared, but which we fail to find. It described a method of using acid in connection with wax, but fail to remember the kind of acid best to use.

Answer.—For etching on steel a ground of wax is required composed of equal parts asphaltum, Burgundy pitch and beeswax melted together and thoroughly incorporated. The tool to be marked should be warm, so that the wax will readily melt on touching it. The space to be marked should be covered with the wax. When cold the required name or design can be scratched on the surface and the grooves thus made filled with a mixture of 1 part nitric acid and 4 to 6 parts of water. Care should be taken to see that the acid is brought in contact with the parts to be marked. After a few minutes the acid will cut sufficiently and can be washed off by dipping the article in hot water. The surfaces are then to be cleaned off by using benzine. Another method is to make a varnish of asphalt and turpentine with a few drops of linseed oil to make it tacky. Make the design or name with which the goods are to be marked with some of the varnish thinned down with turpentine, either with a rubber stamp or by applying the varnish with a quill pen or other suitable tool. Now surround the design with a small rim of beeswax and apply the acid as above. After the biting of the acid has been sufficient it should be washed off with warm water and the varnish removed with turpentine.

COMPOSITION OF PEWTER.

From J. G. S., Rochester, N. Y.—Please tell me in *The Metal Worker* what is the exact composition of No. 1 pewter, also called britannia, and No. 2 pewter.

Answer.—We are afraid we cannot answer our correspondent precisely in this matter, for the recipe books give a variety of pewter and britannia metals and we do not see that any of them are referred to as Nos. 1 and 2 pewters. Common pewter consists of 80 parts tin and lead with various additions of copper, antimony, zinc and bismuth. In a table given in "Brannt's Receipt Book" three pewters are described. The first is 81.2 tin, 5.7 antimony, 1.6 copper and 1.15 lead. Another is 83.3 tin, 6.6 antimony, 1.6 copper, 3.6 zinc and 1.6 bismuth. If our correspondent has samples of the pewters he wishes to make he could easily have them analyzed by a chemist and discover just what their composition was.

HOW TO ESTIMATE HORSE-POWER.

From R. A., Maryland.—Please explain in *The Metal Worker* the best method of finding the horse-power of an engine, also of a boiler. My reason in asking is that I have been told at least four different ways.

Answer.—The following rule for finding the indicated horse-power of a steam engine is taken from "Kent's Mechanical Engineers' Pocket Book," which is supposed to be an authority on such matters: Multiply the mean effective pressure in pounds per square inch on the piston by the length of the stroke in feet and by the area of the piston in square inches and by the number of single strokes per minute (that is, double the number of revolutions), and divide the whole by 33,000.

Concerning the horse-power of a steam boiler it is a somewhat indefinite phrase and was generally meant to be an approximate measure of the boiler. A committee of the American Society of Mechanical Engineers decided that a horse-power, in reference to a boiler, meant a boiler that would evaporate 30 pounds of water per hour from a feed water temperature of 130 degrees F. into steam at 70 pounds gauge pressure. According to Kent the average proportions for maximum economy for boilers fired with anthracite coal are 11½ square feet of heating surface per horse-power with ⅓ square foot of grate surface per horse-power.

VENTILATION FOR OIL STOVES.

From J. H. C.—I am heating an 8 x 12 room having two windows and a door, neither closing tight, with a 3-inch diameter wick oil stove with central draft. It works to satisfaction, except that I must keep the door partly open or my table kerosene lamp stove will go out. Do many of the late pattern stoves require so much ventilation or is mine peculiar?

Note.—We think our correspondent's case is decidedly peculiar, for in a room 8 x 12, with two windows that he says are leaky, and necessarily with cracks around the casement of the door, we do not understand how it is possible to so vitiate the air as to put the lamp flame out. Of one thing, however we are very certain. If we were sitting in a room and saw a lamp go out through lack of oxygen we would make great haste to get out of that particular room, for the atmosphere that cannot support combustion is decidedly unfit for the support of human life. We cannot but think that there must be some other cause of the difficulty rather than lack of air. If any correspondents can suggest a solution of the mystery, we shall be glad to hear from them.

MANUAL TRAINING IN GERMANY.

It is 24 years since the movement having for its object the manual training of boys was inaugurated in Germany. In this space of time the idea has been disseminated largely in the Empire and now over 2000 teachers are engaged in the work. Nevertheless, according to a report recently made to the State Department at Washington by George Sawter, United States Consul at Glauchau, the conditions connected with this branch of tuition leave much to be desired. The original training in home industries has almost disappeared. It is only carried on at present in a few places in Holstein and in a number of institutions for the blind. Most of the other educational establishments in Germany have already introduced manual training into their curriculum. But the endeavor to prepare the pupils directly for engaging in a handicraft has obtained importance in only two of Germany's institutions of learning. The majority of the German industrial schools only deal pedagogically with the subject. There exist at present in Germany, distributed in 605 places, 861 schools and institutes wherein manual training is carried on in 1514 workshops. Of this number 836 schools and institutes conduct the training on a pedagogical basis. The principal center in which these classes are established are Prussia, Upper Silesia, the Rhenish Province and Saxony. The 1514 workshops are situated in 286 independent manual training schools and 238 public schools, the rest being connected with various kinds of private educational establishments. The organization of the handicraft tuition in the individual schools and institutes is varied in character. Sixty-nine institutes have adopted the whole curriculum as recommended by the German Association for the Dissemination of Manual Skill, while 16 dispense with the preparatory work. Of the rest 177 schools and institutes confine themselves to three branches, 261 limit themselves to two and the remainder to one branch only. Five hundred and thirty-five workshops are devoted to wood carving, 527 to working in cardboard and 336 to the carpenter's bench. Of these 68 are closely connected with wood carving, 77 with preparatory roughing out work, 35 with metal work, 28 with country timbering, 11 with turnery and 11 with modeling in clay. The participation of German teachers in the work of manual training under the association is steadily increasing. Twenty-two hundred teachers have up to now been taught to become instructors in this branch, the majority of whom have been trained in Leipsic.

The flour output at Minneapolis, Minn., in 1899 was the largest on record, amounting to 14,291,780 barrels, against 14,232,595 barrels in 1898. In 1878 the production was only 940,000 barrels.

TRADE REPORT.

MARKET SUMMARY.

Pig Tin has advanced 1c., with an active demand and stocks well under control.

Copper shows a stronger front and values rule a shade higher.

Pig Lead is firm and active, with the possibility of a further advance.

Spelter is steadier in price, but domestic demand is tame.

Tin Plates are not notably active, but firm as to price.

Black Sheets rule slightly higher. Inquiry is active on the strength of proposed consolidation.

Galvanized Sheets are stronger for the same reason.

Sheet Copper manufacturers, it is believed, will announce a reduction in base price.

Pig Iron is quiet, with some shading of prices on No. 2 Foundry in the East.

Steel Billets are quoted $1 a ton lower in Pittsburgh.

Scrap Iron continues quiet, but stocks are firmly held and sellers' quotations range somewhat higher.

Hardware is moving into consumption in increased volume, with good business conditions through the country. Prices in general are strong and some advances are noted.

Plumbers' Supplies are meeting with an excellent demand for the season. Prices all around are firm and tend upward.

Drawn Lead Traps and Bends were advanced 5 per cent. in price.

Boiler Stands have been marked up 20 per cent.

Solder is quoted about 1c. per lb. higher owing to the rise in Tin.

Block Tin Pipe has been advanced 2½c. per lb. for similar reason.

METAL MARKET.

Pig Tin.—A more active market has prevailed throughout the week, and as a result prices have advanced about 1c. per lb. The London market advanced again sharply, helping the upward spirit of prices here. At the close the metal was firm and buoyant. Jobbers quote Straits Pig in small lots at 28½c. per lb. Arrivals thus far this month have been small, but the indications are that they will be heavier next week, and will foot up to about 3000 tons for the month. It is understood, however, that the whole of the amount will be well under control.

Copper.—There has been little or no change in the situation, except that the firmer tone of the market referred to last week has become more pronounced. It is said that the increase in both domestic and foreign demand continues, and that at the moment a good business is forthcoming from both of these quarters. London is firmer and a better feeling prevails abroad. The outlook is regarded by the trade as encouraging. Retail prices are firm at 17½c. per lb. for Lake Ingot in small lots and 16½c. for Ansonia Grade Casting Copper. The returns of Copper production for December show an output of domestic mines of 23,788 tons, or only 400 tons more than in November. Exports last month were 50 per cent. larger than in November. These figures substantiate the reports of a tremendous increase in the demand from abroad.

Sheet Copper.—The situation is unchanged in this department. Sales were of fair amount and almost exclusively for current consumption, while inquiry showed considerable activity. The manufacturers of Sheet Copper held a meeting on Thursday, which was adjourned to the following day. It was generally expected that an announcement of reduction in prices would result, but nothing in this direction had transpired up to the time of writing. The impression prevails, however, that a lower range of prices will be agreed upon to correspond with the present value of the raw material. The base price of 22½c. per lb. is still quoted, but this price is usually shaded by jobbers.

Pig Lead.—This metal maintains its position of firmness, although the premium lately prevailing for spot has disappeared. Prices are very steady, however. Dealings were of fair amount and there was quite a brisk movement of Lead in a retail way. Jobbers quote American Pig in small lots at 5⅛c. to 5¼c. per lb.

St. Louis advices are as follows: Pig Lead is strong and prices firm. It is an absolute fact that no grounds existed for low quotations in press reports last week. Brokers themselves paid 4.65c. for Chemical late in the week, and begged for it.

Spelter.—While quiet this metal is steadier as to price and a firmer tone is said to prevail. An increased demand has come from abroad, but no stimulation of activity has developed on the part of the galvanizing interests here. Jobbers are still quoting good Western brands in small lots at about 5¼c. per lb.

St. Louis advices are as follows: Spelter is weak and inactive. About 800 tons bought at low prices are said to be in brokers' hands, and so long as this remains prices may keep down. At present cost of Ore smelters see no profit, and one of the principal companies has posted notices of a contemplated shut down. It is rumored that negotiations are again about to be attempted to reconcile differences between prices of Ore and Spelter.

Sheet Zinc.—Jobbers quote 600-lb. cask lots at 7¾c. per lb. and smaller quantities at 8c. to 8¼c.

Antimony.—No change has been made. Cookson's in small parcels is quoted at 11¼c. per lb., Hallett's at 10¼c. and U. S. at 10c. to 10¼c.

Nickel—Is steady and unchanged at 40c. to 42c. per lb. for small lots.

Aluminum.—The demand continues large, with prices unchanged at 37c. per lb. for small lots and 35c. for 100-lb. lots of No. 1 Ingot, guaranteed over 99 per cent. pure.

Tin Plates.—There is no remarkable activity in this market, although dealings are rather above the average for the season. Prices remain quite firm and steady. Consumers appear satisfied that there will be no change for some time to come. Consequently they are buying only as their needs dictate. Production is increasing by the starting up of a large number of temporarily idle mills, consequently there is little apprehension of a scarcity of supply. The retail trade report unusual activity for the season in the way of small orders. Jobbers quote small lots of American Bessemer Coke Plates, IC, 14 x 20, delivered at New York or corresponding point, at $5.25 to $5.30 per box.

Chicago advices are as follows: Nothing new has developed, manufacturers being in receipt of good business, while jobbers report a moderate movement from stock. Prices are unchanged.

Sheet Iron.—There is more inquiry for Sheets and the general tone of the market is stronger. This is due to the fact that the trade are aware of the movement under way to combine the Sheet mills and are placing orders more liberally, fearing that prices will be advanced if the deal goes through. Most of the Sheet mills, however, are refusing to take orders for delivery further ahead than February. Jobbers here quote No. 27 Common Black Sheets in small lots at 3.40c. to 3.45c. Galvanized Sheets are stronger, with small lots at 70 and 5 to 70 and 10 per cent. off.

Chicago advices are as follows: Prices are getting a little firmer. Manufacturers are not making the concessions which were easily obtained a short time since. While prices are stronger the demand has also improved. Large buyers are endeavoring to place contracts at present quotations for deliveries running through the year. Manufacturers are unwilling to sell for shipment later than June, and are insisting on delivery of equal portions in both quarters thus covered. Jobbers report a fair trade, and quote small lots at 3.25c. to 3.40c. for No. 27 Black, and 70 and 10 per cent. off on Galvanized Sheets.

Old Metals.—The market is quiet and values show little change. At the same time dealers are holding firm and in some quarters prices are a trifle stiffer, especially in Scrap Iron. Dealers quote about the following buying prices for moderate sized lots, delivered at yard in New York and vicinity:

Heavy Copper, per lb.	14½c.
Light and Tinned Copper, per lb.	13¼c.
Heavy Brass, per lb.	10½c.
Light Brass, per lb.	8¼c.
Lead, per lb.	4¼c.
Tea Lead, per lb.	4 c.
Zinc, per lb.	3½c.
No. 1 Pewter, per lb.	17 c.
No. 2 Pewter, per lb.	9 c.
Tin Plate Scrap, per gross ton	$6.00
Wrought Iron Scrap, per gross ton	13.50 to $14.00
Heavy Cast Scrap, per gross ton	11.50 to 12.00
Stove Pipe Scrap, per gross ton	8.00
Burnt Iron, per gross ton	6.50

THE PIG IRON MARKET.

New York.—During the past week two interests in this market have purchased 10,000 tons in the aggregate. It is understood that the buyers are among the strongest in this section, and that some liberal concessions were made. Prices are as follows: Lehigh and Schuylkill Irons, No. 1 Foundry, $24 to $25; No. 2 X, $22.50 to $22.75; No. 2 Plain, $21.50 to $22. Southern brands are quoted: No. 1 Foundry, $22.75 to $23; No. 2 Foundry, $21.75 to $22; No. 1 Soft, $22.50 to $22.75; No. 2 Soft, $21.50 to $22; No. 3 Foundry, $21.50 to $21.75.

Chicago.—Some sales offices report a few sizeable transactions of 500 to 1000 tons each, but generally trade is quiet. A good demand is observed for lots for quick shipment, which is caused by furnace companies being unable to make full deliveries on contracts. The inquiries received are quite numerous, and if all of them were to lead to actual business the buying movements would be heavy. Sales agents are confident that the necessities of many consumers must bring them into the market before very long. Prices are firmly held from first hands, occasional sales being made below the regular prices by parties who can spare a portion of their early purchases to take advantage of the fine profit which present prices represent. We quote for cash as follows:

Lake Superior Charcoal	$25.50 to $26.00
Local Coke Foundry, No. 1	24.50 to 25.00
Local Coke Foundry, No. 2	23.50 to 24.00
Local Coke Foundry, No. 3	22.50 to 23.00
Local Scotch, No. 1	25.00 to 25.50
Ohio Strong Softeners, No. 1	25.50 to 26.00
Southern Silvery, according to Silicon	25.50 to 27.00
Southern Coke, No. 1	22.85 to 23.35
Southern Coke, No. 2	21.85 to 22.35
Southern Coke, No. 3	20.85 to 21.30
Southern Coke, No. 1 Soft	21.85 to 22.35
Southern Coke, No. 2 Soft	21.85 to 22.85

Philadelphia.—The market for Pig Iron looks a little better, not that it has been at all bad at any time, but there are signs of increasing activity, and some movements which indicate the probability of a stiffening in prices. There is a fair supply of Iron at quoted rates, but anything like active buying would easily start an upward movement in prices. Stocks are so small that there is no necessity for pushing sales, and especially with such a prospect as there is for a continued good demand. Sales in most cases have been at a full average of the figures recently quoted, at which to-day's market may be considered strong with a moderate degree of activity. Prices are about as follows for seaboard or nearby deliveries: No. 1 X Foundry, $25 to $25.50; No. 2 X Foundry, $23.25 to $24.25; No. 2 Plain, $22.50 to $23.

Pittsburgh.—The established price for Bessemer Iron for first half is being held, but very little metal is being sold. Consumers are covered. The furnaces are sold up and the market is likely to be quiet for some time. No. 2 Foundry, $22.35 to $22.50 for Southern, $23 to $23.25 for Northern, and Bessemer, $24.90, f.o.b Pittsburgh.

Cincinnati.—Aside from the fact that there are a few more inquiries for lots of Pig Iron up to 4000 tons, there has been no perceptible change in the market since a week ago. The volume of new business is perhaps swelling a little, but not enough to cause any comment. There is but little expectation of much increase within the next week. The energies of the trade, however, are pretty well occupied with the care of business already booked. Consumers are taking Iron as fast as they can get it, and are in many cases pushing for faster deliveries. In the absence of any buying movement the price-list is nominally unchanged and the situation is considered a very strong one. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$21.75
Southern Coke, No. 2	20.75
Southern Coke, No. 3	19.75
Southern Coke, No. 4	19.50
Southern Coke, No. 1 Soft	21.75
Southern Coke, No. 2 Soft	20.75
Southern Coke, Gray Forge	$19.00 to 19.25
Southern Coke, Mottled	19.00 to 19.25
Ohio Silvery, No. 1	30.00
Ohio Silvery, No. 2	29.00
Lake Superior Coke, No. 1	$24.00 to 24.50
Lake Superior Coke, No. 2	23.00 to 23.50

St. Louis.—Large inquiries are still kept off the market. Orders for small lots come in, but do not aggregate a heavy tonnage. Southern furnaces say they have practically nothing on hand, all available Irons being swept up. No softness in price has come to light, and taking price of Ore in connection with fuel outlook, no shading is at all anticipated. It is understood that bids at $5 per ton have been made for Coke. On the whole it does not seem that production will be materially increased for some time. No let up is noted in pressure for delivery on contracts, but pleading is made to advance shipping dates. We quote on cars St. Louis:

Southern, No. 1 Foundry	$22.25 to $22.50
Southern, No. 2 Foundry	21.25 to 21.50
Southern, No. 3 Foundry	20.25 to 20.50
No. 1 Soft	22.25 to 22.50
No. 2 Soft	21.25 to 21.50

The labor organizations connected with the Chicago building trades are taking steps to secure a general advance in wages April 1. The carpenters, who now receive 42½ cents an hour, have notified contractors that they will not work for less than 50 cents, which makes an advance of 60 cents for their working day of eight hours. The electrical mechanics name 25 cents per day as their expected advance. Other unions will follow the lead of the carpenters and electricians. It is believed that the contractors will comply with the demands made upon them.

The Board of Construction of the Navy Department have granted an extension of twelve months over the contract period for the completion of the 22 torpedo boats now building for the United States Navy. The action was based on a petition from seven shipbuilding firms in which it was stated that the steel makers could not possibly furnish the material for the new vessels in time to enable the contractors to complete them within the contract limitation of time.

CHICAGO REPORT.

Old Metals.—Consumers are buying very little, but dealers are showing considerable confidence by buying rather freely. Dealers quote buying prices as follows for full carloads of Iron and Steel and small lots of metals, delivered on cars in Chicago:

	Per ton.	Per lb.
Country Wrought Scrap	$14.00 to $15.00	.....
Machinery Cast	12.50	.....
Malleable Cast	12.00	.....
Stove Plate (free of burnt)	8.50	.....
Burnt Iron and Grate Bars	7.00	.....
Sheet Iron and Hoops	7.00	.....
Plow Steel and Breaking Stock	11.00	.....
No. 2, such as Shovels, Hoes, &c.	8.00	.....
Old Boilers—whole (Iron)	9.00	.....
Old Boilers (Iron)—cut in single Sheets and Rings	12.00	.....
Old Gas Pipe and Boiler Tubes	11.00	.....
Cast Borings	9.00	.....
Turnings	10.50	.....
Horseshoes	14.00	.....
Copper Wire and Heavy	....	14 c.
Copper Bottoms	....	12 c.
Copper Clips	....	13 c.
Red Brass	....	13 c.
Yellow Brass	....	10 c.
Red Brass Borings	....	11 c.
Yellow Brass Borings	....	9 c.
Light Brass	....	7½c.
Pipe Lead	....	3¾c.
Tea Lead	....	3½c.
Zinc	....	3¼c.
Rubber Shoes	....	8 c.
Rubber Car Springs, &c	....	4 c.
Inside Bicycle Tubing	....	18 c.
Outside Tubing	....	5½c.
Garden Hose	30.00	.....
Air Brake Hose	50.00	.....

Anthracite.—The demand shows no improvement. Chestnut is as scarce as ever and held at $6, Chicago. Carload lots are quoted as follows, per net ton:

	Grate.	Egg and Stove.
Chicago, Ill	$5.50	$5.75
Milwaukee, Wis	5.50	5.75
St. Louis	5.75	6.00
Kansas City, Mo	7.50	7.75
Council Bluffs, Iowa	7.50	7.75
Lincoln, Neb	7.65	7.90
Sioux City, Iowa	7.90	8.15
Aberdeen, S. D	8.75	9.00
Dubuque, Iowa	6.80	7.05
Madison, Iowa	7.00	7.25
St. Paul, Minn	8.00	8.25
Burlington, Iowa	7.00	7.25
Des Moines, Iowa	7.50	7.75
Davenport, Iowa	6.80	7.05
St. Joseph, Mo	7.50	7.75
Leavenworth, Kan	7.50	7.75
Omaha, Neb	7.50	7.75

THE HARDWARE TRADE.

THERE are few changes in prices to note. The volume of business increases somewhat as the month advances. Jobbers are finding orders coming in quite freely, indicating a good condition of business with the trade throughout the country. The purchases are for the most part to complete assortments, the stocks of many goods in retailers' hands being ample for early requirements. There is little speculative buying on the part of either jobbers or retailers, and the jobbers especially are generally adhering to the policy deliberately adopted by many of them to market stocks in hand or under contract before entering liberal orders at the prices now ruling. This policy is not to be regarded as resulting from a conviction that there is to be an early or radical break in the market, for most of them take a decidedly cheerful view of the outlook, anticipating that the volume of business will be large and prices probably well maintained for some time. They, however, consider it a matter of prudence to realize the handsome profits which goods in their warehouses will yield them if marketed under existing conditions. When the goods are disposed of they can act intelligently in view of the situation as it then presents itself. In this way they will be sure, assuming that the goods are both sold and paid for, of a satisfactory outcome of the present condition, which may be imperiled if high priced goods are held too long, or the policy of buying speculatively be carried too far. Careful and intelligent retail merchants are regarding the matter in a similar light and are conducting their business so as not to be caught with heavy stocks of high priced goods when the reaction sets in. Their business generally is, however, so good that Hardware is moving freely and a profitable trade is being carried on. The high prices of certain lines are doubtless interfering somewhat with consumption, and enterprises are in many cases being deferred in view of increased costs of materials and supplies. During the past week there have been few important changes in price, the tone of the market continuing decidedly firm. In a good many lines manufacturers are apparently desirous of booking orders, and in some instances slight concessions are made. In most lines, however, manufacturers are adhering firmly to quotations and are guarded in the acceptance of orders for future delivery. Collections are excellent, and the outlook for a large business is very promising.

NOTES ON PRICES.

Plumbers' Supplies.—Continued activity is noted in this department, the volume of business being unusually large for the season. Higher prices are announced in some lines and further withdrawals of quotations by manufacturers indicate early advances in other quarters. Particulars of these are given below.

Drawn Lead Traps.—We spoke last week of the prospect of an advance in the price of Drawn Lead Traps and Bends. This advance took place on January 15. It applies to all kinds and sizes of Drawn Lead Traps and Bends and shows a net advance of 5 per cent. over the prices previously quoted.

Boiler Stands.—Following the lead of the Central Foundry Company the various manufacturers of Boiler Stands have advanced the prices on these articles about 20 per cent. on prices previously quoted. All quotations are now f.o.b. foundry. There is a freight allowance on carload lots and over, with the usual terms.

Cast Iron Sinks.—From information that has reached us we believe that there will be an advance in the price of Cast Iron Sinks in the near future. This will include the regular Sinks, Square Sinks, Half Round Sinks, Corner and Slop Sinks, Plain Sink Backs, Centennial and Novelty Sink Backs, New Pattern Kitchen Sinks and the various other kinds used by the plumbing trade.

Enameled Bathtubs.—Under date of January 16 the Dawes & Myler works of the Standard Sanitary Mfg. Company announce the following list prices on Keystone quality seconds Baths:

4 feet	$26.00
4½ feet	29.00
5 "	32.00
5½ "	37.00
6 "	43.00

Lists on Eclipse quality are as follows:

4 feet	$27.00
4½ feet	30.00
5 "	33.00
5½ "	38.00
6 "	44.00

When seconds or B quality Baths are ordered the foundry reserves the right to send either grade and bill them at the prices quoted. All orders for seconds are to be accepted only on condition that they shall be able to furnish them. There will be the usual charge for packages and no freight allowance.

Under the same date the Ahrens & Ott works of the same concern announce the following lists on seconds or class B Bathtubs made at the Louisville, Ky., foundry:

	4 feet.	4½ feet.	5 feet.	5½ feet.	6 feet.
Leader Economy	$26.00	$29.00	$32.00	$37.00	$43.00
Columbia Favorite French Pat Roll Rim	27.00	30.00	33.00	38.00	44.00

They make a similar reservation regarding the shipping and billing of either grade of Tub that they may have in stock, with similar conditions regarding freight and packages.

Meyer-Sniffen Company.—Under date of January 15 the

Meyer-Sniffen Company, New York City, withdraw all quotations and state the list prices quoted in their catalogue D are obsolete and are not now in force. They request that pending the issue of their new catalogue the jobbers and plumbers submit lists of their goods that they may be asked to estimate on and secure a quotation upon their wants.

Block Tin Pipe.—A sharp upward reaction in the Tin market has been followed by an advance in the quotation on Block Tin Pipe to 40c. per lb., subject to the usual trade discount of 20 per cent.

Solder.—Manufacturers of Solder have advanced prices about 1c. per lb. on the strength of the renewed strength of Pig Tin. Half and Half, guaranteed, in small lots is quoted at 19c. to 20c. and No. 1 at 16c. to 17c. per lb.

Utica Drop Forge & Tool Company.—Smith & Hemenway Company, 296 Broadway, New York, advise us that the Utica Drop Forge & Tool Company have recently changed their terms to meet with the ideas expressed at the recent National Hardware Association Convention relative to cash discounts. They not only believe in giving a little cash discount, but to the man who pays promptly they are naming from this date on better discounts than given heretofore. Their terms in the future will be as follows:

3 per cent. off for cash in 5 days from date of invoice.
2 " " " " 10 " " " " " "
1 " " " " 20 " " " " "

These terms will be strictly adhered to and parties taking 6, 11 or 21 days will not be allowed these terms, those discounting in six days being given 2 per cent., in 11 days 1 per cent. and after 20 days net.

Corrugated Sheets.—There is a good demand for Corrugated Sheets, which are selling much better than at the same period last year, although prices are materially higher and very strong at that.

Tinners' Stock.—The movement in Tinners' Stock is also much better than usual this month and prices are generally firm.

Stamped Ceilings, &c.—Manufacturers of Stamped Ceilings and Sidings report a very satisfactory business, which is considerably ahead of that of a year ago. Prices are firmly held and consumers are buying freely notwithstanding the higher cost.

Bird Cages.—A 10 per cent. advance has been made by the manufacturers of Bird Cages.

Sash Cord.—There has been a further advance of ½c. per pound in the price of Braided Sash Cord.

Wire Cloth.—The market for Wire Cloth is in a peculiar and not altogether satisfactory condition. While most of the jobbers have covered their requirements for the coming season there are a good many jobbing houses and large retailers who have not yet made contracts. The manufacturers, however, are not in a position to accept further orders, owing principally to the difficulty they experience in obtaining Wire. As a consequence, while a few weeks ago the manufacturers' price was $1.40, this price and practically all others have been withdrawn, and manufacturers are refusing to make contracts. The present condition of the Wire Cloth and Netting industries, so far as the manufacturers are concerned, is one of entire dependence on the ability of the Wire drawers to furnish Wire. The unprecedented demand for Iron and Steel outside of the Wire industries has affected both the supply and the price of Wire. There is so large an amount of Billets being diverted from the Rod and Wire mills into Rails, Architectural and Bridge Construction and Merchant Iron that the scarcity of Wire is being felt to-day more than at any other time during the past 12 months. This feature is the cause of the difficulty the manufacturers experience in making deliveries at all promptly, and there does not seem to be any avenue of relief opening by which the manufacturers of Wire Cloth and Netting may receive an ample supply of Wire, except that of the increased products from the mills now under construction. The advances recently made in Wire directly affect Wire products and the shortage of Wire gives additional tone to the market. It is well known that manufacturers have been forced to pass desirable orders, being unable to obtain Wire to make the goods, so that there is every indication of the constantly increasing firmness of the market until the close of the present season.

Tin Cans.—The Indiana State Canners' Association, in annual session at Indianapolis January 17, fixed prices on Tin Cans for the year as follows: Standard 3-lb. Cans, 85c. per dozen; 2-lb. Cans, 65c. per dozen, and Gallon Cans, $2.40 per dozen, being an advance of about 15c. per dozen over last year's prices, due to the increased cost of Tin Plates.

Wire Nails.—The conditions in the New York market remain unchanged. Demand is for small lots, but it is referred to as good for the season. Irregularity still exists in the price of small lots of Nails from store, which are quoted at $3.50 to $3 75.

Cut Nails.—There are no new or especially interesting features in the market. Demand is moderate and evidently for immediate requirements. The price to retailers in small lots still lacks uniformity. Small lots from store, New York, are quoted at $2.75 to $2.80.

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ROOFING SUPPLIES, METALS, TIN PLATES, &c.

REVISED JANUARY 19, 1900.

The following New York quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....℔ lb., 37¢
100-lb lots.....℔ lb., 35¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

	Wider than.....	6-in.	14-in.	24-in.
	And including.....	14-in	24-in.	30-in.
		℔ lb	℔ lb.	℔ lb.
Nos.	13 to 19.....	$0.42	$0.44	$0.47
"	20.....	.44	.46	.49
"	21 to 23.....	.46	.48	.51
"	24.....	.46	.50	.53
"	25.....	.47	.51	.54
"	26.....	.47	.54	.59
"	27.....	.48	.57	.62
"	28.....	.48	.57	.64
"	29.....	.49	.60	.69
"	30.....	.50	.64	.77

Note.—Lots of less than 50 lbs 5¢ ℔ lb extra.

Antimony—

Cookson.....℔ lb. 11¼¢
Hallett's.....℔ lb., 10¼¢
U. S.....℔ lb., 10@10½¢

Brass—Planished.....net
Roll and Sheet.....15% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List Feb. 26, 1896.

Plain Round Tube.	Per lb.
¼-in. up to 2-in.	$0.35
⅝-in. up to ¾-in.	.36
½-in. up to ⅝-in.	.38
⅝-in. up to ⅞ in.	.41
5-16-in. up to ⅜-in.	.48
¼-in. up to 5-16-in.	.65
3-16-in. up to ¼-in.	1.00
⅛-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
3-in. and larger	Special
2-in. to 3-in. to No. 19, inclusive.	38

30% off.

Copper & Bronze Tubing—

3¢ ℔ lb more than Brass.

Conductors—

Corrugated. *Round or Square.*—
Galvanized ⅛ or more, N'st'd. 60&20&2½%
" Less than ⅛, Nested..... 60&20%
" Locked Joints, ⅛ or more, Nested..... 60&20&2½%
Galvanized Locked Joints, less than ⅛, Nested..... 60&20%

Spiral Riveted.

Galvanized.....40%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ℔ lb 26½¢ basis
Lake Ingot.....17½¢
Ansonia Grade Casting.....16¾¢
Planished.....net
Sheet and Bolt.....22½¢ ℔ lb basis

Tubes—See *Seamless Brass Tubes*

Eaves Troughs—

List Feb. 1, 1895.

Lap or Slip Joint, Galvanized, in crates 75&10%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Eastern List.

Tin.....30%
Galvanized.....30%

Stove Pipe—

New York Four-Piece.

	4	4½	5	5½	6-inch.
No. 1.	$0.80	.85	.90	1.00	1.05 per doz
No. 2.	.65	.70	.75	.80	.85 "
No. 3.	.60	.63	.65	.70	.80 "

Elbows and Shoes—

Corrugated

Round or Square.

Galvanized.....60%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16.....	℔ lb, 3.20...	3.20¢
Nos. 17 to 21.....	℔ lb, 3.25...	3.30¢
Nos. 22 to 24.....	℔ lb, 3.30...	3.40¢
Nos. 25 and 26...	℔ lb, 3.35....	3.45¢
No. 27	℔ lb, 3.40....	3.50¢
No. 28	℔ lb, 3.45....	3.60¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ lb 10½¢
Do. Stained.....6¢@10¢
Patent Planished ℔ lb A, 10½¢; B, 9½¢ net

Galvanized.

Nos. 10 to 16	℔ lb, 12¢	70&5@70&10% off.
Nos. 17 to 21	℔ lb, 13¢	
Nos. 22 to 24	℔ lb, 14¢	
Nos. 25 to 26	℔ lb, 15¢	
No. 27	℔ lb, 16¢	
No. 28	℔ lb, 17¢	
No. 29	℔ lb, 19¢	
No. 30	℔ lb, 21¢	

36 in. 1¢ ℔ lb higher

Kerosene—See *Petroleum Products*

Lead—

American Pig	5½@5¾¢
Bar	6¼¢
Pipe (full coils and lengths)	7 ¢
Pipe (cut coils and lengths)	7½¢
Tin Lined Pipe	12½¢
Block Tin Pipe	40 ¢
Sheet Lead (full rolls)	8 ¢
Sheets (cut rolls)	9 ¢

20% off.

Old Lead in exchange, 4¼¢ ℔ lb.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per lb.....40@42¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's	7½¢
Lead. Amn. White, in oil	7½¢
Lead, Red, bbls. and ⅛ bbls	7½¢
Lead, Red, kegs	7½¢
Linseed Oil:	
Raw, ℔ gal	55¢
Boiled	57¢
Spirits Turpentine:	
In bbls	54¢
In cases	62¢
Putty:	
In barrels and ⅛ bbls	2¼¢
In tubs	2¼¢
In tin cans	3¼¢
In bladders	2¾¢

Palm Oil. 1500 lb casks.

Fancy Lagos	℔ lb 5⅛¢
Clarified	℔ lb 4⅝¢
Accra	℔ lb 4⅝¢
Half Jack	℔ lb 4⅜¢

Petroleum Products—

In Barrels (Barrel Included)

Stove Gasoline.....℔ gal. 13@14¢
Kerosene.....℔ gal. 13¾@13¢

Pipe, Drain.....50%

Pipe, Spiral—See *Conductors.*

Registers—

List Feb. 1, 1899.

Black Japanned.....30%
White Japanned.....25%
Nickel Plated.....30&10%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....30%
Electroplated in Brass, Bronze or Copper.....30&10%
White Porcelain.....20%
Solid Brass and Bronze Metal.....20%

Roofing Material—

Asphaltum, Trinidad Refined, ℔ ton.....$30.00@$35.00
Asphaltum, Rock. ℔ ton.....$14.00
Heavy Single Ply Tar Felt.....℔ lb 2½¢
2 Ply Roofing Felt, ℔ roll, 108 sq. ft. $1.30
3 Ply Roofing Felt, ℔ roll, 108 sq. ft. 1.70
Roofing Pitch ℔ bbl.....$2.40@$2.50

Rosin

(Barrels of 280 lb. Barrels weigh actually about 400 lb).

Common and Good—Strained.

Rosin, C. & D.	℔ bbl. $1.60	@$1.65
Rosin, E. & F.	℔ bbl. 1.70	@ 1.75
Rosin, G. & H.	℔ bbl. 1.80	@ 1.85
Rosin, I. & K.	℔ bbl. 1.95	@ 2.15
Rosin, M. & N.	℔ bbl. 2.50	@ 2.95

Seamless Brass Tubes—

Net List, February 6, 1899.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.

Pennsylvania:

Best Bangor, ℔ sqr	$3.00@$4.00
No. 1 Bangor Ribbon, ℔ sq	2.85@ 3.25
Pen Argyle, ℔ sqr	3.00@ 3.75
Peach Bottom, ℔ sqr	4.75@ 5.35
No. 1 Penna. Black, ℔ sqr.	2.80@ 3.50
No 1 Chapman Keystone, ℔ sqr	3.25@ 4.25

Vermont:

Sea Green, ℔ sqr	$2.50@$3.15
Purple, ℔ sqr	3.75@ 4.35
Unfading Green, ℔ sqr	3.00@ 4.35
Red, ℔ sqr	7.00@11.00

Maine:

Brownville, Unfading Black:	
No. 1 quality	$5.00@6.50
No. 2 quality	$4.00@5 50

Solder and Soldering Fluids—

Solder—

⅛&¼ guaranteed.....19@20¢
No. 1.....16@17¢

Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.

Per gal.....60¢

Concentrated Soldering Flux.
f.o.b. New York.

In barrels. ℔ lb.....4¢
Smaller quantities, ℔ lb.....5¢

Eureka Soldering Flux—Triple Strength.

In barrels, ℔ lb.....3 ¢
Smaller quantities, ℔ lb.....3½¢

Eureka Soldering Flux—Extra Concentrated

In barrels, ℔ lb.....4½¢
Smaller quantities, ℔ lb.....5 ¢

Eureka Soldering Flux—Crystal.

In 100-lb cases, ℔ lb.....7¢

Gedney's Soldering Fluid.

In carboys or barrels, ℔ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Kester's Soldering Salts.

Half-lb can.....25¢
1-lb can.....50¢
5-lb can.....$1.50

Lennox Soldering Fluid.

In barrels, ℔ lb.....2¢
In carboys. ℔ lb.....3¢

Perfection Soldering Flux.
No charge for package.

Bbls. about 500 lb, ℔ lb.....3¢
½ bbls., about 300 lb, ℔ lb.....3½¢
Kegs, about 110 lb, ℔ lb.....3½¢
Kegs about 55 lb, ℔ lb.....4¢

Yager's Soldering Salts.

1 lb bottles, each.....60¢
5 lb bottles, ℔ lb.....40¢

Soldering Coppers—

Per lb.....21½@22½¢

Spelter—

Western Spelter.....5¼@5½¢

Spiral Pipe—See *Conductors.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....50%

Tin Pigs and Bars—

Banca, Pigs. ℔ lb.....39¢
Straits, pigs. ℔ lb.....28¾¢
Straits, in bars. ℔ lb.....29¾¢

Tin Plates, American

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland Grade:		
IC,	14 x 20	$7.50
IX,	14 x 20	9.00
IXX,	14 x 20	10.25
IXXX,	14 x 20	11.50
IXXXX,	14 x 20	12.75
Melyn Grade:		
IC,	14 x 20	7.00
IX,	14 x 20	8.50
IXX,	14 x 20	9.75
IXXX,	14 x 20	11.00
IXXXX	14 x 20	12.25
Allaway Grade:		
IC,	14 x 20	6.15
IX,	14 x 20	7.25
IXX,	14 x 20	8.35
IXXX,	14 x 20	9.45
IXXXX,	14 x 20	10.55

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC, 14 x 20	$5.30@5.40
"	IX, 14 x 20	$6.25@6.30

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb	15¢
95 lb	20¢
90 lb	25¢
85 lb	30¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

About 40 lb coating	$16.25@16.75
About 30 lb coating	14.50@15.00
About 20 lb coating	13.00@14.00
About 15 lb coating	11.50@12.00
About 8 to 10 lb coating	10.50@10.75

Boiler Plates, American—

IXX, 14 x 26..(112 sheets).....$13.00
IXX, 14 x 28..(112 sheets).....14.00
IXX, 14 x 31..(112 sheets).....15.50

Troughs Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved pattern, ℔ doz...18.00

Tubing—

Tin.....50% | Galvanized.....50%
Fittings for do.....40%

Zinc—

600 lb casks ℔ lb.....7¾¢
Per lb.....8@8¼¢

PLUMBERS' AND STEAM FITTERS' SUPPLIES.

Fittings—

List of Oct 7, 1899.

Cast Iron Fittings, Black and Galvanized, Standard sizes.....55%
Cast Iron Bushings and Plugs.....55%
Cast Iron Flanges.....55%
Malleable Iron Fittings.....35@40%
" " Bushings.....55%
" " Unions.....55%
Wrought " Nipples.....50@55%
" " Couplings.....55%
" " Long Screws.....60%

Cast Iron Soil Pipe—

2 to 6 inch inclusive.

Standard.....45%
Extra Heavy.....50%
All Fittings.....55%

Wrought Iron Pipe—

List Feb. 22, 1899.

1¼ and less, Plain.....40@45%
1¼ and less, Galv.....45@50%
1½ and larger, Plain.....40@45%
1½ and larger, Galv.....45@50%

Screw and Socket Joint Casing.....45@45&10%
Inserted Joint Casing.....40&10@45%

Valves, Cocks, &c.—

Iron Body Valves.....60&10%
Air Cocks and Radiator Air Cocks.....60&10%
Soldering Unions.....60&10%
" Nipples.....60&10%
Brass Unions (Rough and Finished).60%
Jenkins Bros.':
Iron Body Valves, except Gate Valves.....55%
All Iron Valves, except Gate Valves.....40%
Iron Body Gate Valves.....50%
All Iron Gate Valves.....35%
Iron Cocks, all Iron.....60&10%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.....50&10%
" and Angle Valves, hose outlet.....50&10%
Brass Garden Hose Valves.....50&10%
" Horizontal, Vertical and Angle Check Valves.....50&10%
Brass Safety Valves.....55%
" " " Low Pressure.....55%
" Radiator Valves.....65%
" " Jenkins.....55%

Brass Jenkins' Globe, Angle, Cross and Corner Valves.....55%
Brass Jenkins' Safety and Check Valves.....40%
Brass Jenkins' Gate Valves.....50%
Brass Steam Cocks.....50&10%
" Gas Meter and Union Meter Cocks.....50&10%
Brass Fittings, Rough.....60%
" " Finished.....60%
" Bushings.....60%

Plumbers' Brass Work—

List of December 7, 1896.

Ground Key Work:
Rough.....55@60%
Finished.....50@55%
Compression Work.....50@55%
Chain Stays.....55%
Iron Boiler Couplings, Ground Face, per set.....$1.00
Basin Plugs.....50&10%
Sink or Bath and Wash Tray Plugs.....50&10%
Basin Clamps.....40@80¢ ℔ doz. net

Bath Tubs—

Copper Lined Bath Tubs.....35%
Galvanized Steel Enamel Bath Tubs, list of February 1, 1899....50@50&10%
Steel Clad Copper Lined Bath Tubs, list of Feb. 1, 1899.....40@45%
Porcelain Lined Iron Bath Tubs.....20%
Solid Copper, list of Feb. 1, 1899.....20%

Boilers—

Standard Boilers:
30, 35 and 40 gal.....60&5%
Other sizes up to 52 gal.....55&5%
53 gal. and above.....45&5%
Extra Heavy Boilers:
18 to 52 gal.....50%
53 gal. and above.....40&10%

Sinks—

Cast Iron—

High list.....55@60%
Low list.....50@50&10%

Wrought Steel—

Columbus, Galv'd and Enameled.....45%
Columbus, Painted.....30%
L. & G.....50%

Miscellaneous—

Earthenware, List of July 17, 1899.....Basins, Urinals and Hoppers.....40%
Closet Bowls, Sundries, Washouts and Pedestals.....40%
Drawn Lead Traps, List of Aug. 2, 1897.....30@35%

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Mechanical Engineering Construction Co., 63 5th Ave., N. Y.

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Robinson, J. M. & Co., Cincinnati, O.
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Eller, J. H. & Co., Canton, O.
Friedley & Voshardt, Chicago, Ill.
Kanneberg Roofing Co., Canton, O.
Missouri Sheet Metal Ornament Co., St. Louis, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Vogan & Strauss, Kenosha, Wis.

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Kemp, C. M. Mfg. Co., Baltimore, Md.

Chimney Top Ventilators.
Iwan Bros., Streator, Ill.

Cocks, Ball, Basin and Stop.
Stebbins, E. Mfg. Co., Brightwood, Mass.

Coils.
National Pipe Bending Co., New Haven, Conn.

Combustion Regulator.
Æolipyle Co., 117 Beekman St., N. Y.

Conductor Pipe and Elbows.
Berger Bros. Co., Philadelphia, Pa.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Kanneberg Roofing Co., Canton, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
McClure & Co., Pittsburgh, Pa.
Marlin & Co., Pittsburgh, Pa.
Reeves Iron Co., Canal Dover, O.
Souther, E. E. Iron Co., St. Louis, Mo.
Weyand, Henry, Waterbury, Ct.

Conductor Pipe Hangers.
Iwan Bros., Streator, Ill.

Conductor Pipe Machinery.
Universal Machine Co., Canton, Ohio.

Cooking Utensils.
Hill, Whitney & Wood Co., Waltham, Mass.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.
Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. C. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Phila. Machine Tool Co., Phila., Pa.
Robinson, J. M. & Co., Cincinnati, O.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Cut Offs, Rain Water.
Cooney & Geiger, Indianapolis, Ind.

Dampers.
Arcade Mfg. Co., Freeport, Ill.
Greene, W. F., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Deflectors.
Rutherford, J. & Son, Akron, O.

Die Stocks.
Curtis & Curtis, Bridgeport, Ct.
Fowler Automatic Draft Reg. & Vent. Co., Lawrence, Mass.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

Dumb Waiters.
Energy Mfg. Co., Phila., Pa.

Eave Troughs.
Berger Bros. Co., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Kanneberg Roofing Co., Canton, O.
Marlin & Co., Pittsburgh, Pa.
Souther, E. E. Iron Co., St. Louis, Mo.
Weyand, Henry, Waterbury, Ct.

Eave Trough Hangers.
Berger Bros. Co., Phila., Pa.
Berger Mfg. Co., Canton, O.

Eave Trough Machines.
Marlin & Co., Pittsburgh, Pa.
Universal Machine Co., Canton, Ohio

Elbows, Stove Pipe.
Hill, Jas. Mfg Co., Providence R. I.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Souther, E. E. Iron Co., St. Louis, Mo.

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Lehigh Valley Emery Wheel Co., Weissport, Pa.

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Cleveland Stamping & Tool Co., Cleveland, O.

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Vanderman Plumbing & Heating Co., Willimantic, Conn.

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Koven, L. O. & Bro., 18 Spruce St., N. Y.

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Clark Novelty Co., Rochester, N. Y.
Litchfield, J. M., 105 Beekman St., N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Pots.
Clayton & Lambert Mfg. Co., Detroit, Mich.
Turner, W. W. & Co., Chicago, Ill.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Fittings, Plumbing.
Illinois Mall. Iron Co., Chicago, Ill.
Lawler Water Feed & Damper Regulator Co., 181 Mercer St., N. Y.

Floor Sleeves
Illinois Malleable Iron Co., Chicago, Ill.

Food Cutters.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

Foot Warmers.
Knapp, F. H., Chicago, Ill.

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Pocock, Oliver, Cincinnati, O.

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International Heater Co., Utica, N. Y.

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Barstow Stove Co., Providence, R. I.
Bergstrom Bros. & Co., Neenah, Wis.
Dighton Furnace Co., Taunton, Mass.
Floyd, Wells & Co., Royersford, Pa.
Giblin & Co., Utica, N. Y.
Hart & Crouse Co., Utica, N. Y.
International Heater Co., Utica, N. Y.
Kelsey Furnace Co., Syracuse, N. Y.
Magee Furnace Co., Boston, Mass.
Mueller, L. J. Furnace Co., Milwaukee, Wis.
Schwab & Sercomb, Milwaukee, Wis
Sheppard, Isaac A. & Co., Phila., Pa.
Stamford Foundry Co., Stamford, Ct.
Superior Foundry Co., Little Falls, N. Y.
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Tubular Heating and Ventilating Co., Phila., Pa.

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Keen & Hagerty Mfg. Co. Baltimore, Md.

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Condon, John, Philadelphia, Pa.

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Kemp, C. M. Mfg. Co., Baltimore, Md.
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Fowler Automatic Draft Reg. & Vent. Co., Lawrence, Mass.

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Young, Jos. H., Boston, Mass.

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Amer. Water Back Boiler and Heater Cleaner Co., Chicago.

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Drake, W. H., Newark, N. J.
Gorton & Lidgerwood Co., 96 Liberty St., New York.
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Hart & Crouse Co., Utica, N. Y.
International Heater Co, Utica, N. Y.
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Magee Furnace Co., Boston, Mass.
National Pipe Bending Co., New Haven, Conn.
Sheppard, Isaac A. & Co., Phila., Pa.
Smith & Thayer Co., Boston, Mass.
Thatcher Furnace Co., 240 Water St., N. Y.

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Howard Thermostat Co., Oswego, N. Y.

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Odin Stove Mfg. Co., Ltd., Erie, Pa.

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Garry Iron & Steel Roofing Co., Cleveland, Ohio.

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Tufts, Walter B., 96 John St. N. Y.

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Illinois Malleable Iron Co., Chicago, Ill.
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Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
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New York Iron Roofing & Cor. Co., Jersey City, N. J.
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United Correspondence Schools, 154-158 5th Ave., N. Y.

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Harrington & King Perforating Co., Chicago, Ill.

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Clough, R. M., Tolland, Conn.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Ferracute Machine Co., Bridgeton, N. J.
Keene, Geo. C. & Co., Cincinnati, O.

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Miner & Peck Mfg. Co., New Haven, Conn.
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Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
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Pocock, O., Cincinnati, O.
Robinson, J. M. & Co., Cincinnati, O.
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McClure & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
National Steel Co., Bridgeport, O.
Reeves Iron Co., Canal Dover Ohio.
Struthers Iron & Steel Co., Struthers, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood Alan Co., Philadelphia, Pa.

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Berger Mfg. Co., Canton, O.
Bruce & Cook, 186 to 190 Water St. N. Y.
Cincinnati Corrugating Co., Piqua, O.
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Gummey, McFarland & Co., Phila., Pa.
Kirkpatrick & Co., Ltd., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
National Steel Co., Bridgeport, O.
Osborn, J. M. & L. A., Cleveland, O.
Steel & Iron Metal Coating Co., W. Chicago, Ill.
Struthers Iron & Steel Co., Struthers, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.
Wellsville Plate & Sheet Iron Co., Wellsville, O.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan Philadelphia, Pa.

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Montross Metal Shingle Co., Camden, N. J.

Shot.
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Canton Steel Roofing Co., Canton, O.

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McClure & Co., Pittsburgh, Pa.
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Sanborn, J., 217 Water St., N. Y.
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Turner, W. W & Co., Chicago, Ill.

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Ostrander, W. R. & Co., 204 Fulton St., N. Y.

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Curtis & Curtis, Bridgeport, Conn.

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Schwerdtle & Siebert, Bridgeport, Ct.

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Dixon, Jos. Crucible Co., Jersey City, N. J.

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Marcy Stove Repair Co., 74 Beekman St., N. Y.
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Presbrey Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Taylor, Chas. Sons Co., Cincinnati, O.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

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Stove Patterns.
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Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

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Marcy Stove Repair Co., 74 Beekman St. N. Y.
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Van, John, Range Co., Cincinnati, O.
Weir Stove Co., Taunton, Mass.

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Acme Gas Stove Co., Buffalo, N. Y.
Adler, H. Co., Pittsburgh, Pa.
Dangler Stove & Mfg. Co., Cleveland, Ohio.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Odin Stove Mfg. Co., Ltd., Erie, Pa.
Ringen Stove Co., St. Louis, Mo.

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Monarch Stove & Mfg. Co., Mansfield, Ohio.
Novelty Mfg. Co., Jackson, Mich.
Ringen Stove Co., St. Louis, Mo.
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Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
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Keene, Geo. C. & Co., Cincinnati, O.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 20 Cliff St., New York.

Tinners' Trimmings.
Vogel, Wm. & Bros. Brooklyn, N. Y

Tin Plate
American Tin Plate Co., Chicago, Ill.
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Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Merchant & Co., Inc., Phila., Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Osborn, J. M. & L. A., Cleveland, Ohio.
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Curtis & Curtis, Bridgeport, Conn.
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Meurer Bros. Co., Brooklyn, N. Y.
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Odin Stove Mfg. Co., Ltd., Erie, Pa.

Wind Gates.
Miner & Peck Mfg. Co., New Haven, Ct

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By a New York City firm, working outside FOREMAN, who thoroughly understands shaving exhaust and general blow piping, fan heating and ventilating; steady position to sober and industrious man; write with experience. "Industrious," care *The Metal Worker*, New York. Jan. 20

First-class SALESMAN to handle a full line of stove repairs, stoves, hardware and tinners' supplies as side line on commission. "B. K.," care *The Metal Worker*, Cincinnati, Ohio. Jan. 20

A RANGE and HEATER SALESMAN for New York and vicinity; state terms, amount of business controlled and references. "A. Z.," care *The Metal Worker*, New York. Jan. 20

By April 1 a man who can do first-class tinsmithing and plumbing; one with some knowledge of steam heating preferred; steady work year round; must be industrious and temperate. Box 225, Ludlow, Vt. Jan. 20

TRAVELING SALESMAN for New England States; must be well acquainted with tinners, hardware dealers and contractors and experienced in sheet metal building material line; state age, experience and salary. Wheeling Corrugating Company, 81 Fulton street, New York. Jan. 20

A strictly first-class TINSMITH, who understands furnace work; steady employment at good wages the year round; state age, experience, nationality and references. E. C. DEDRICK, Langdon, N. Dak. Jan. 20

A man capable of doing first-class plumbing, tinsmithing and all work of a country shop; must have good habits and recommendations. Hedge & Hall, Rockland, Mass. Jan. 20

A SALESMAN for a retail hardware and stove store; we want a first-class man who understands the business thoroughly; give age and previous experience. M. E. Loveland, Gouverneur, N. Y. Jan. 20

TINNER; one understanding bicycle repairing; state experience and wages wanted. Foster & Lewis, Gladwin, Mich. Jan. 20

SALESMEN to visit users of emery wheels; state age, experience and salary expected. "Emery," care *The Metal Worker*, New York. Jan. 13

A good TINNER; one with experience in cornice and skylight work. J. H. Brice, Washington, Pa. Jan. 13

A first-class TINNER for inside and outside work; steady employment the year round; must be temperate. A. R. Kanney, Greenspring, Ohio. Jan. 13

To correspond with salesman or manufacturers' agent selling hardware or heating trade. "Sell," care *The Metal Worker*, New York. Jan. 13

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TRAVELING SALESMAN; only first-class man need apply; give age, experience and references. Address Garry Iron & Steel Roofing Company, Cleveland, Ohio. Jan. 13

A first-class TINSMITH; young man with some knowledge of plumbing preferred; one accustomed to general jobbing in a country shop; to right party, steady work assured; state age, reference and salary wanted. "K.," care *The Metal Worker*, Mason Building, Boston, Mass. Jan. 13

SITUATIONS WANTED.

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By a young man, 22, with six years' experience at tinsmithing and plumbing; strictly temperate and honest; best of reference. Isaac J. McNeilly, Box 140, Mt. Morris, N. Y. Jan. 20

By a man of 25 years' experience as plumber, steam and hot water fitter, also furnace and tin work, a steady job in a town from 2,000 to 10,000 inhabitants. A. E. Wilcox, 63 Henry street, Norwich, N. Y. Jan. 20

A young man, 22, with three years' experience at tinsmith trade, desires to finish trade; will work cheap; city or country; A1 reference. E. Quackenbush, 70 West 107th street, New York. Jan. 20

As SALESMAN or BOOKKEEPER by a young man with ten years' experience in the wholesale stove business; can speak German. John P. Clark, 2217 Magazine street, Louisville, Ky. Jan. 20

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By a first-class PLUMBER; either city or country. T. F. McCarty, 1000 Fulton street, Brooklyn, N. Y. Jan. 20

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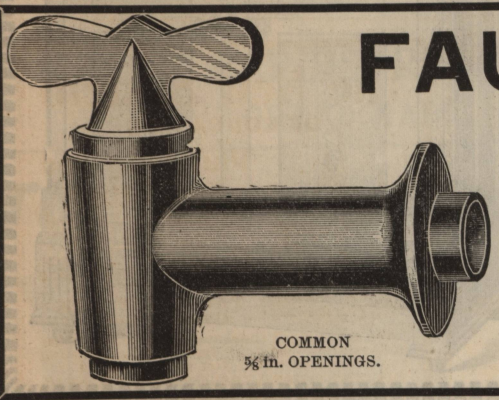

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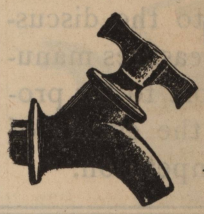

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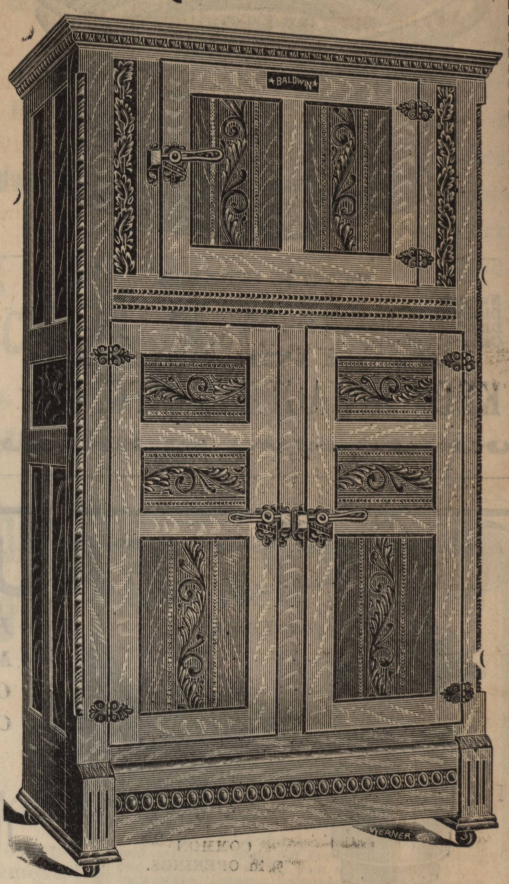

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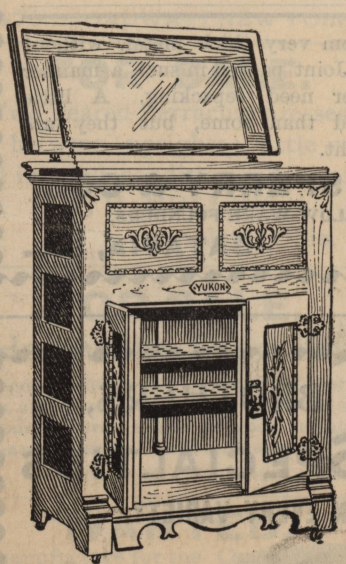

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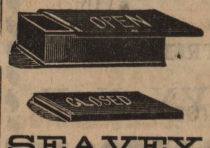

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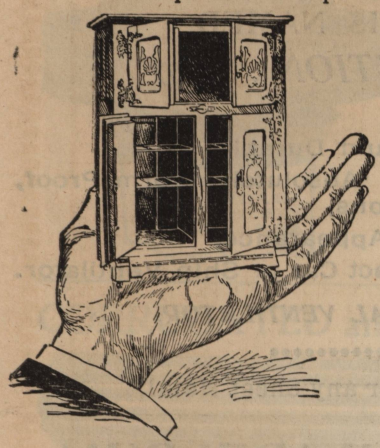

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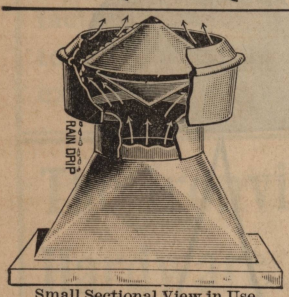

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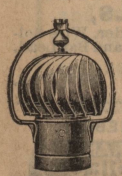

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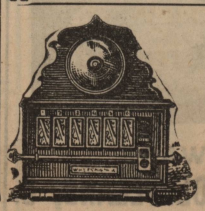

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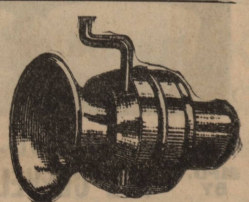

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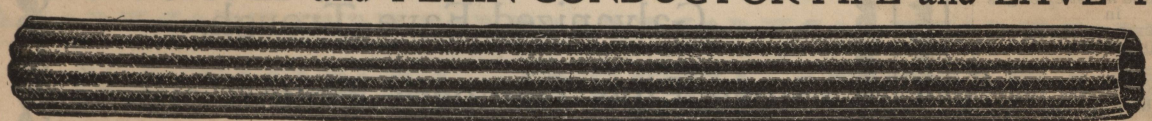

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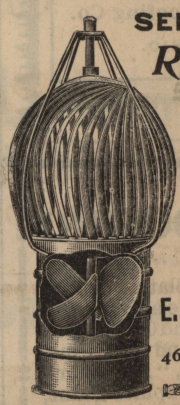

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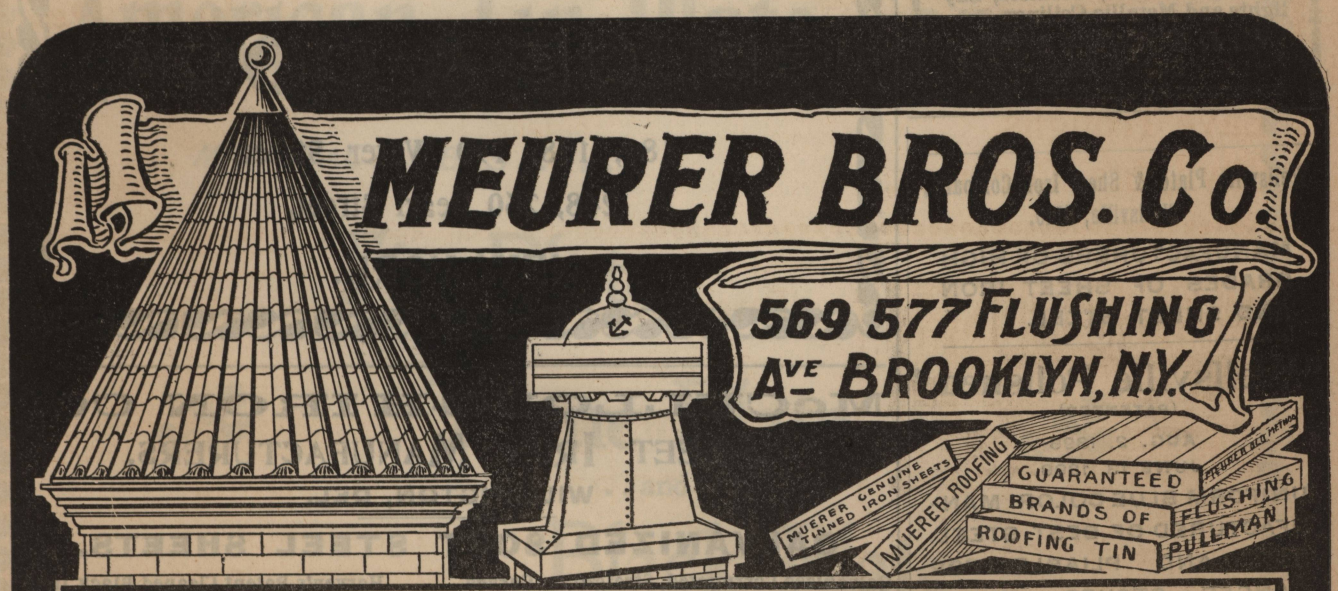

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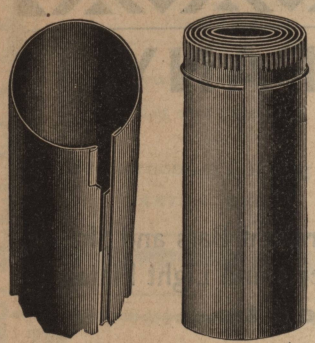

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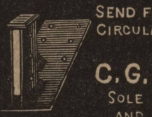

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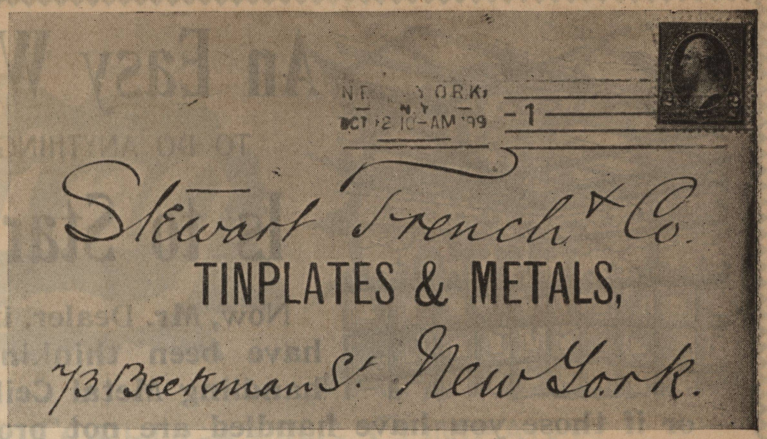

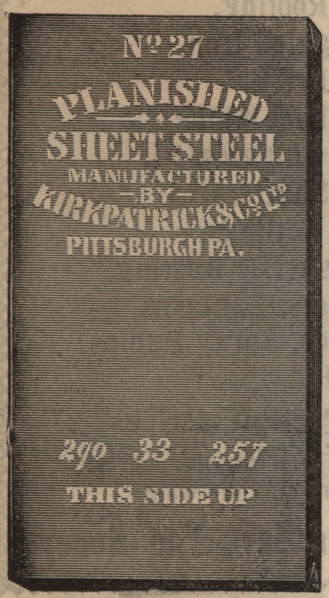

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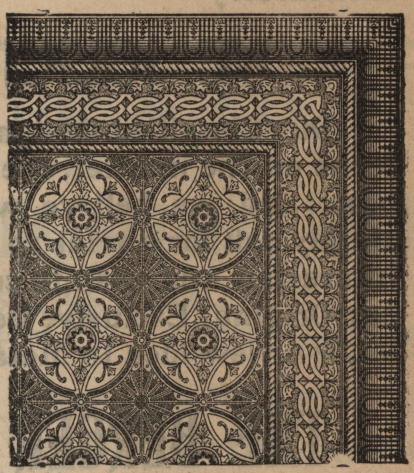

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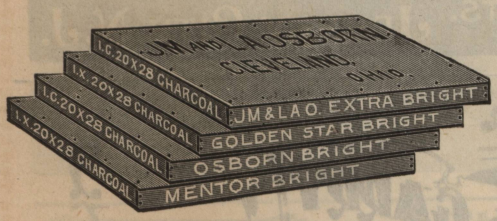

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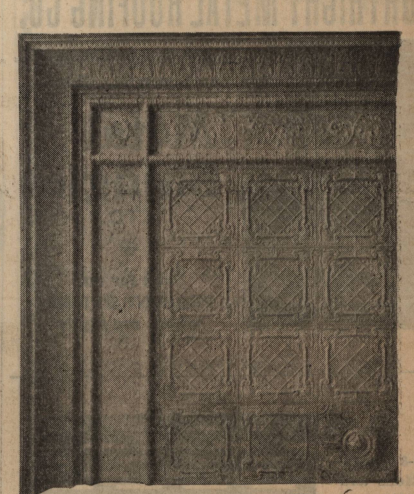

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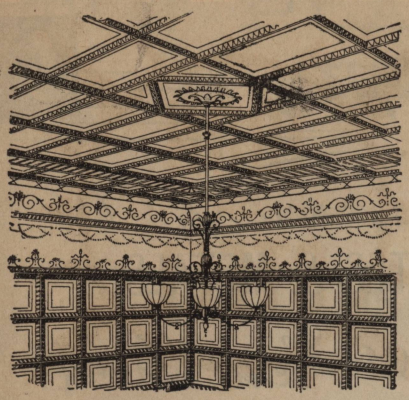

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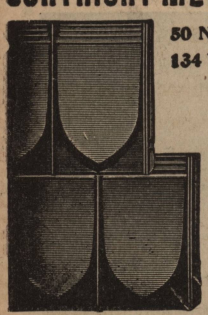

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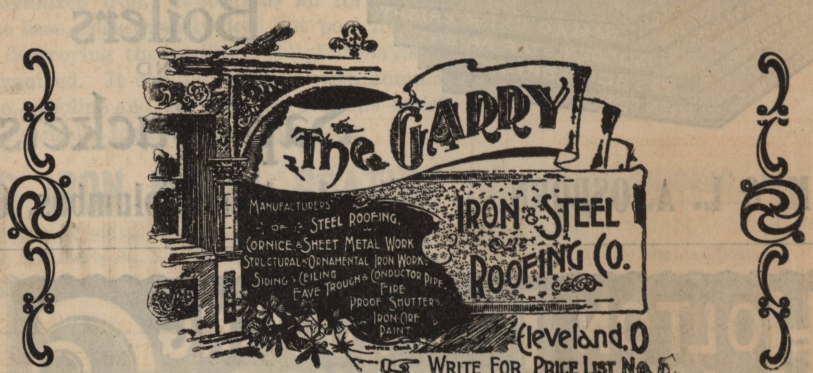

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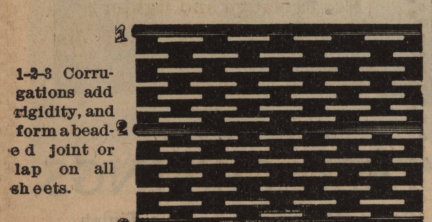

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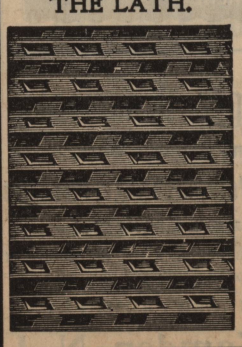

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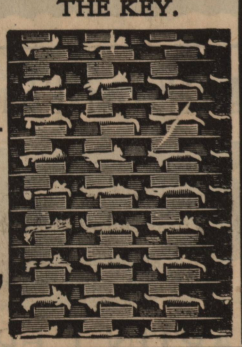

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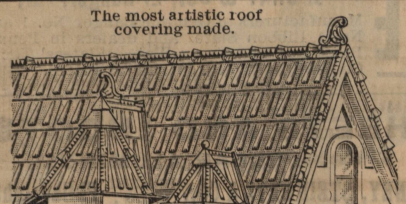

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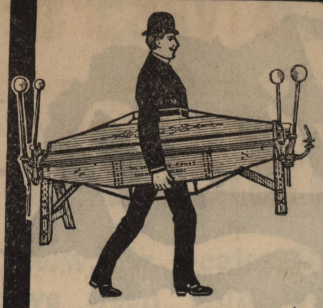

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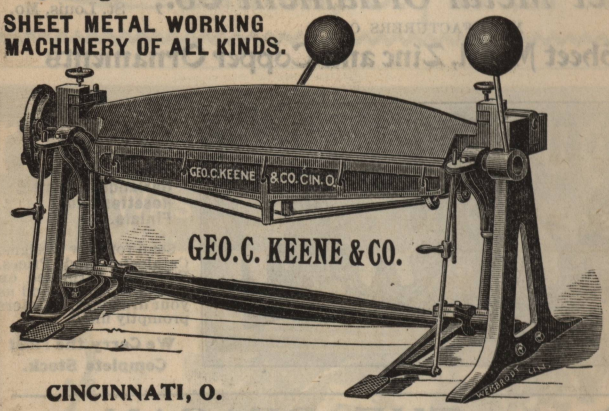

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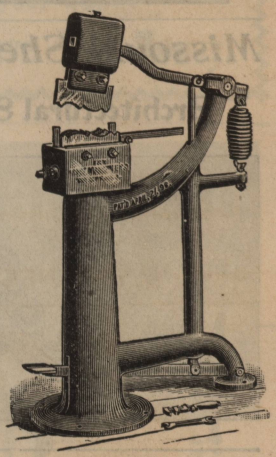

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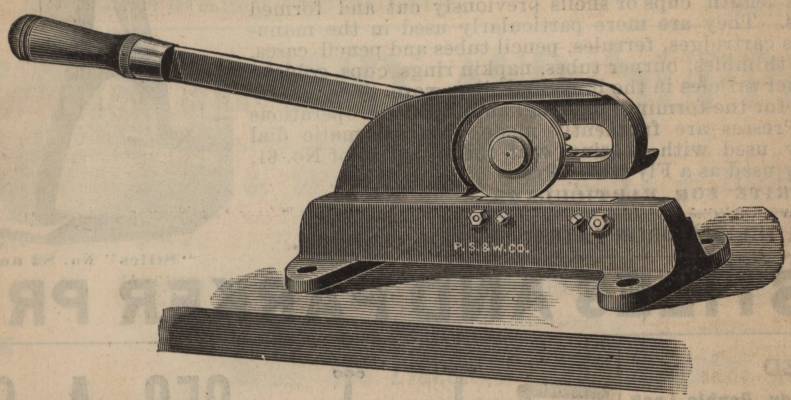

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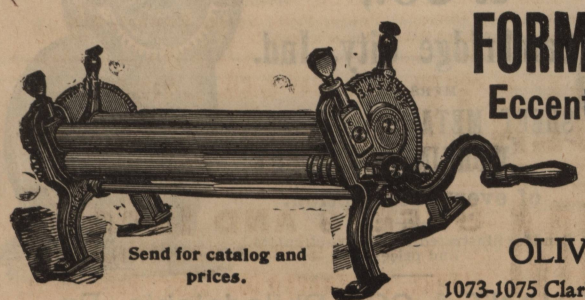

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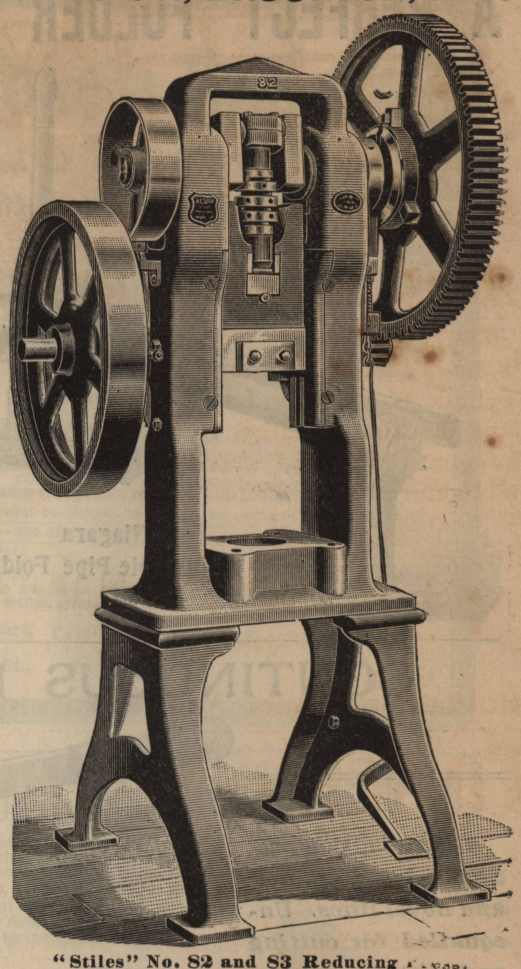

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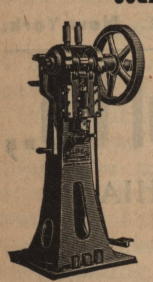

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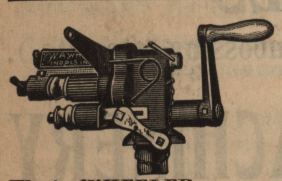

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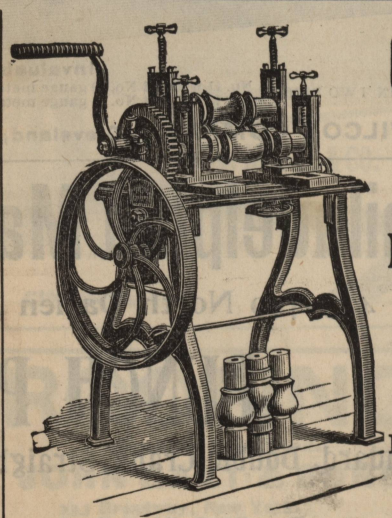

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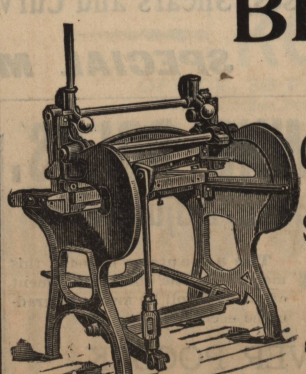

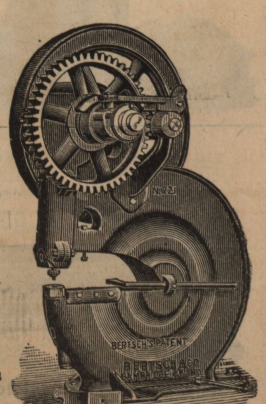

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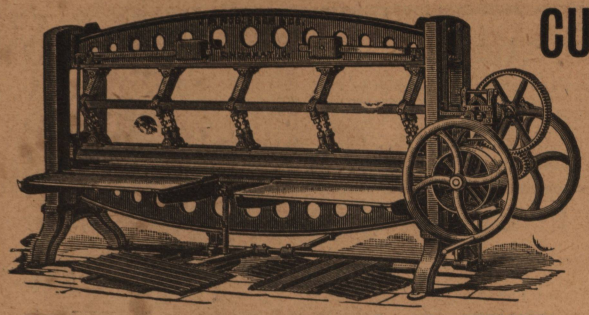

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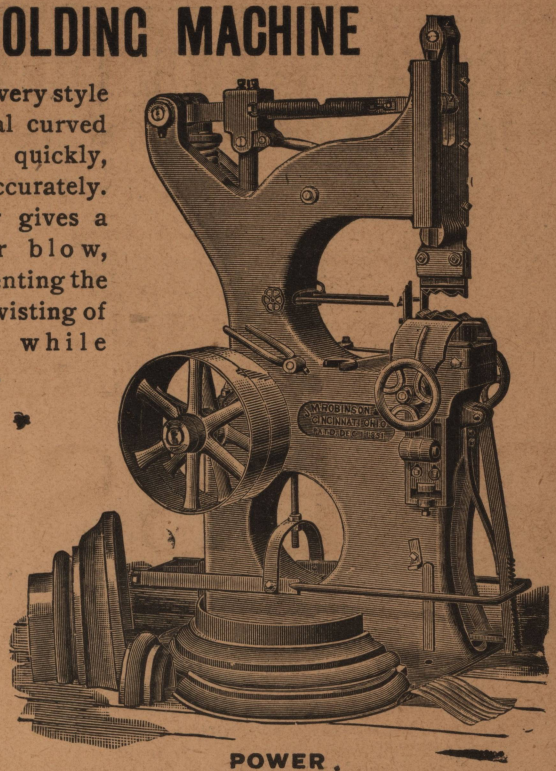

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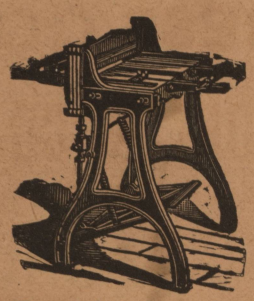

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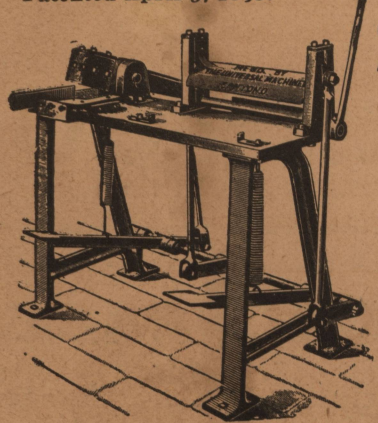

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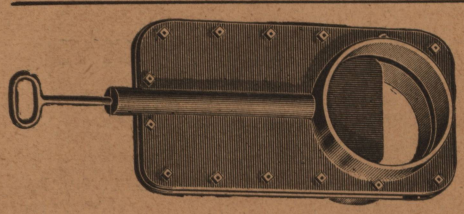

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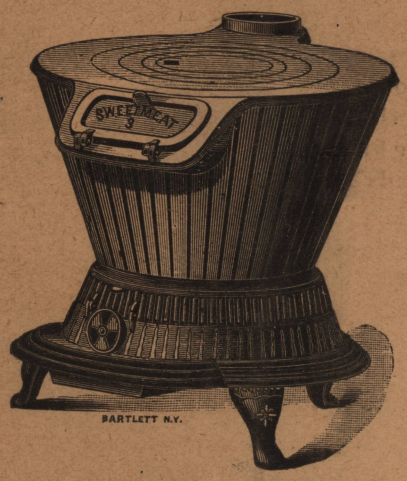

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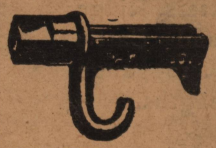

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